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THE PROFESSIONAL GEOGRAPHER

VOLUME XIII MARCH 1961 NUMBER 2

THE ROLE OF THEORY IN GEOGRAPHICAL INQUIRY

F. Lukermann

University of Minnesota

THE RELATION between theory and reality has always been a moot point in scientific discussion. The recent note by Leslie J. King is testimony to both the existence and necessity of that debate in geography. *(1)* Unfortunately the note contains a gift of Pandora. As preface to an otherwise lucid statement on a logical and positivist relationship between theory and reality, King offers a quotation from W. Christaller which, rather than supporting the subsequent argument, puts in question the entire nature of geography as a science, viz:

> ". . . the theory [central place] has a validity completely independent of what reality looks like only by virtue of its logic and the satisfying level of knowledge. This *co ipso* theory is then confronted with reality. In meeting this problem, it becomes clear to what extent reality corresponds to theory and to what extent it is explained by it, and in what respects reality does not correspond with the theory and therefore is not explained by it. These unexplained facts have then to be clarified by historical and geographical methods because they are concerned with personal, historical and naturally-conditioned 'resistances' – factors which result in deviations from the theory. They have nothing to do with the theory itself and above all cannot be cited directly as proof against the validity of the theory." *(1, 2)*

Three points may be raised, two of which can be discussed summarily for the purpose of this paper; the third is the important point in question. First, the concept of central place is not a theory in the sense King wishes to define theory. Central place, as defined by Christaller, is purely a classification, a taxonomy. The meaningful propositions are concerned with categories rather than variables, and the conclusions are limited almost exclusively to functionalist statements about the requisite character of the categories. However, for the purpose of this discussion, the so-called theory may be assumed to be what it actually is not.

Secondly, Christaller distinguishes not one but three types of research methods and kinds of explanations: theoretical, historical, geographical. Each is presumably mutually exclusive of the other. This trichotomy hardly serves the purpose of justifying either a scientific (theoretical?) geography or King's psycho-physical reductionism. The tripartite division of the knowledge of reality is a familiar philosophic theme; it stems from Kant and nineteenth century neo-Kantianism and is a basic tenet of the mainstream of German geographic methodology. Nevertheless, it is untenable and should be rejected. The stricture that reality may be viewed separately in a *systema naturae* (science), separately in time (history), and separately in space (geography), is not a possible choice. *(3)* Moreover, the Kantian concept of *a priori* time and *a priori* space is by definition not empirically verifiable. Most importantly, the entire conceptual framework is unnecessary for substantive geographic research. Characteristically the argument has been always a programmatic plea for disciplinary unique-

ness rather than scientific wholeness. For these reasons Christaller's advocacy of this position may be ignored; it need not color our argument even though it undoubtedly colored his.

The Christaller argument. The third point of the quotation is directly of interest, namely that reality is explained to the degree it corresponds with theory. That is, at the knowledgeable level, verified theory is the surrogate of reality. Empirically verified theory is not merely an aid to knowing; it is knowing. This view of the role of theory as reality makes plausible what is undoubtedly a majority opinion among modern geographers – that models, correlations, and like measures can explain what is observed. It is not always understood that the word explain, when used in this context, does not necessarily imply or identify *cause* nor answer the question *why*.

An example of a central place problem may help clarify the points made above. A typical Christaller explanation is illustrated in Figure 1. The taxonomic structure (not extended) is given on the left; the observed structure (southwestern Saskatchewan) is given on the right. The pyramidal hierarchy of desired and actual services, populations, and distances are tabulated below for the Swift Current, Saskatchewan system. Thus, the observed distribution is "theoretically" explained except for the deviations or residuals from the taxonomically desired, which remainder must be clarified historically and geographically. *(4)*

The above view may be labelled a positivist view of the relation between theory and reality even though Christaller, in originating his theory, does not seem to have followed very closely the inductive prescriptions cited by King. There are other views, two of which we may examine in that they clarify the assumptions behind much current geographic research and incidentally illuminate the opposition to the above stated doctrine.

A rationalist argument. Occupying a position which may be called essentially rationalist are some views of A. Losch. It is pertinent that Losch's concern is basically geographic; in fact, his work in this instance is specifically directed at geographers and statisticians. Furthermore, Losch and Christaller are intimately connected in their common concern over the development of the so-called central place theory. Losch writes:

> "Theory may be compared with reality for various ends, according to the sort of theory held. If it is to *explain* what actually is, the examination attempts to discover whether it started with a correct idea of its subject and arrived at an explanation that not only seemed possible but also corresponded with reality. On the other hand, if theory is to *construct* what is rational, its assumptions may still be tested by facts, but not its results . . . a comparison with existing structures will not show whether [the] blueprints are accurate . . . whether the theoretical structure has been properly erected . . . for the existing structure may be as faulty as the projected one . . .
>
> "No! Comparison now has to be drawn no longer to test the theory, but to test reality! Now it must be determined whether reality is rational. In any case this, and not verification of theory, is the purpose of the following investigations . . . It is my desire to reinforce in my readers the conviction that a rational economic order is not only conceivable but realizable.
>
> "Long enough has our science considered indiscriminately everything that *is*, even where the problem has been not to explain but to construct . . . In a word, it must not become a science that describes chaos instead of preaching order." *(5)*

The appeal of Losch to many urban and economic geographers is well known. *(6)* This attachment is particularly strong among geographers who look upon prediction as the *sine qua non* of science. It is in this latter appeal, and in the directive to those who wish to explain what actually is, that our interest is centered. Theory as explanation must met three criteria according to Losch. Its consequences must correspond with reality, its assumptions must be correct, and its operation must be possible. What is correct and possible in a theoretical sense is not made clear, but

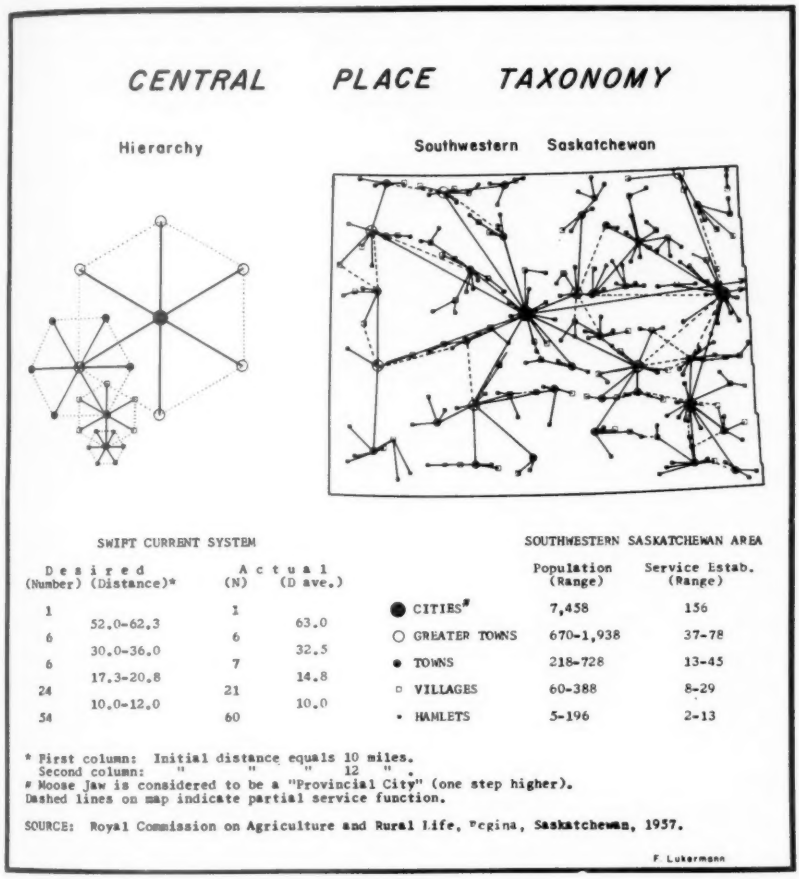
CENTRAL PLACE TAXONOMY
Hierarchy
Southwestern Saskatchewan
SWIFT CURRENT SYSTEM
Desired (Number) (Distance)*
Actual (N) (D ave.)
1 52.0-62.3 1 63.0
6 30.0-36.0 6 32.5
6 17.3-20.8 7 14.8
24 10.0-12.0 21 10.0
54 60
SOUTHWESTERN SASKATCHEWAN AREA
Population (Range)
Service Estab. (Range)
CITIES# 7,458 156
GREATER TOWNS 670-1,938 37-78
TOWNS 218-728 13-45
VILLAGES 60-388 8-29
HAMLETS 5-196 2-13
* First column: Initial distance equals 10 miles.
Second column: " " " 12 " .
Moose Jaw is considered to be a "Provincial City" (one step higher).
Dashed lines on map indicate partial service function.
SOURCE: Royal Commission on Agriculture and Rural Life, Regina, Saskatchewan, 1957.
F. Lukermann

FIG. 1

logically it can only mean that if all conditions are met theory becomes reality. It should follow that if theory is used to construct, what is constructed is explained by the theory. It is difficult to see how this tautology actually differs from that outlined in the first case of "to explain." Is the further question which Losch poses – the testing of reality by theory to determine whether reality is rational – in any wise different? If a reality is observed which fits no known theory, is reality irrational? Is it not the theory that is wanting? To phrase the relation between theory and reality as Losch does in his second instance is to insist that to know is not initially derived from experience but from logical constructs. Experience is to be judged *a priori*.

An empirical argument. A radically different approach from the rationalist viewpoint of Losch and the positivism of Christaller is to state the relation between theory and reality as wholly symbolic and a matter of convention. That is, to look upon theory as a fiction, as a useful device of discourse to further observation. Hypotheses and models are not to be viewed

as reality, they are not substitutes for reality, they are not analogues of reality, but rather they are logical (linguistic and mathematical) constructs selected *ad hoc* to clarify and communicate the observation, measurement, recording, and classification of empirical events.

An illustrative example from central place studies again may be used. One of the underlying assumptions of the central place thesis of Christaller and Losch is the existence of a functional hierarchy among cities. This assumption is normally linked to a statistical regularity described by the rank-size rule. That such a regularity exists in city sizes and services, for certain periods and areas, there is little doubt; that there is a hierarchy of classes is another matter. We need discuss only the rank-size regularity which also is known to exist for other statistical compilations such as the incidence of professional papers, income, words, *et al.*

Evidence of a rank-size regularity is given in Figure 2. The uppermost linear distribution is the population rank-size of the first hundred places in the Prairie Provinces; the second, the first hundred places in Saskatchewan; the third, the first hundred places in southwestern Saskatchewan. The bottommost linear distribution is the service establishment rank-size of the first hundred places in southwestern Saskatchewan. The regularity in each case is evident; a hierarchy of classes is not. The central place pyramidal hierarchy is observed to be more of a continuum than a series of strata, stages, levels, or classes. *(4)*

The question posed is this. Is there a theory which *explains* the statistical regularity? There are theories (models) which *account for* the regularity, i.e., predict or match the curve, but is this an explanation? The models in question of H.A. Simon and M.J. Beckmann have been outlined previously in the geographical literature by B.J.L. Berry and W.L. Garrison, but their conclusions and implications should be reviewed inasmuch as there is confusion concerning the degree of explanation provided. *(7)*

Admittedly, Simon's stochastic model successfully approximates rank-size observations. He refuses, however, to say that

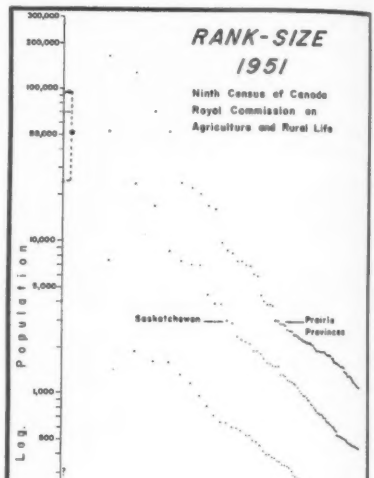

FIG. 2

his model explains the distributions although it may provide a base for making analogies between the distributions. His two conclusions emphasize the gap between theory and reality: (a) the fact that particular data conform to a distribution and can be given a plausible interpretation in terms of a model tells little about the underlying phenomena beyond what is contained in the assumptions; (b) the substitution of one frequency distribution for another cannot be considered an explanation. *(7)*

Beckmann, in the discussion of his hierarchical model, also invokes a stochastic process:

> "The conclusion . . . that all cities on the same hierarchical level have equal size must of course be understood as not more than a rough approximation.

> It is more realistic to assume that the factor . . . by which city size is blown up from each level to the next is a random variable. After a fair number of such multiplications, the product will show a (log normal) distribution pattern." *(7)*

Beckmann would go beyond Simon and say that the stochastic process explains the distribution of various social parameters. It is to be doubted that any causal significance can be attached to this use of the word explain. Despite this ambiguity, the Simon-Beckmann discussion in general seems applicable to most statistical problems in geography today. If so, the argument is clear: a theory has reference solely to its assumptions. It *explains* only its hypotheses. The matching or covariation of one frequency distribution with another is not an explanation.

These three views of the relation between theory and reality are all held currently in geography in some degree. King holds that "laws or a theory provide an explanation of reality." Beyond this point the relationship between theory and reality is not spelled out other than in the statement that in geography there appears to be no logical basis for denying that "theories can be expanded and modified to provide a closer approximation of the reality to which they apply." *(1)* Berry and Garrison both look upon empirical investigation as serving no useful purpose unless it leads to the initiation and verification of theory. *(7)* Yet this does not clarify either the meaning of explanation nor does it define theory *vis-a-vis* reality. In the absence of such declarations one can only cite the numerous instances where Simon is said, by them, to explain rank-size regularities, and to assume that theory and reality have for them a more intimate relationship than a traditional empiricist position would give it.

The one important point in all this is that geographers must be concerned over how they explain reality. Whether they contend that they explain by merely describing what they observe, or explain by taxonomic procedures (formalistic, functionalistic, or genetic classifications), or explain by historical procedures (reasons for human actions rather than causes of events), or explain theoretically under one of the headings outlined above, geographers cannot avoid their methodology or lack of it. One cannot do substantive research without knowing how one explains, and how one explains is methodology.

Nor is the question "explanation of what" to be avoided. As Sauer succinctly states ". . . the question as to what geography is must continue to be asked, because the answer determines the premises under which the data have been assembled." *(8)*

* * *

(1) King, L.J., "A Note on Theory and Reality," *The Professional Geographer*, Vol. XII, No. 3, May, 1960, pp. 4-6.

(2) Christaller, W., *Die zentralen Orte in Suddeutschland*, Jena, 1933, translation by C.W. Baskin, *A Critique and Translation of Walter Christaller's Die Zentralen Orte in Suddeutschland*, Bureau of Population and Urban Research, University of Virginia, Ph.D. dissertation, Charlottesville, 1957 (unpublished), pp. 102ff.

(3) *Kant's Gesammelte Schriften*. Band IX, Physische Geographie, Physische Erdbeschreibung, Einleitung: 4, Berlin und Leipzig, 1923.

(4) *Service Centers*, Royal Commission on Agriculture and Rural Life, Report No. 12, Regina, 1957; *Ninth Census of Canada 1951*, Vol. I, Population, Ottawa, 1953.

(5) Losch, A., *The Economics of Location* (translation of second revised edition, *Die raumliche Ordnung der Wirtschaft*, Jena, 1939, 1943, by W.H. Woglom and W.F. Stolper), New Haven, 1954, pp. xvii and 363ff.

(6) Garrison, W.L., "Spatial Structure of the Economy: I," *Annals of the Association of American Geographers*, Vol. 49, No. 2, June, 1959, pp. 232-239.

(7) Simon, H.A., "On a Class of Skew Distribution Functions," *Biometrika*, Vol. 42, 1955, pp. 425-440; Simon, H.A., "Productivity Among American Psychologists: An Explanation," *American Psychologist*, Vol. IX, 1954, pp. 804-805; Beckmann, M.J., "City Hierarchies and the Distribution of City Size," *Economic Development and Cultural Change*, Vol. XI, No. 3, April. 1958, pp. 243-248; Berry, B.J.L., and Gar-

rison, W.L., "Alternate Explanations of Urban Rank-Size Relationships," *Annals of the Association of American Geographers*, Vol. 48, No. 1, March, 1958, pp. 83-91; Berry, B.J.L., "The Spatial Organization of Business Land Uses," Chapter Three of *Studies of Highway Development and Geographic Change* by W.L. Garrison, *et al.*, Seattle, 1959; Garrison, W.L., "Verification of a Location Model," *Northwestern University Studies in Geography*, No. 2, Evanston, 1957, pp. 133-140.

(8) Sauer, C.O., "Geography, Cultural," *Encyclopaedia of the Social Sciences*, Vol. VI, New York, 1931, p. 621.

CAICOS: SITE OF COLUMBUS' LANDFALL

Robert H. Fuson

The University of South Florida

ON FRIDAY, October 12, 1492, Christopher Columbus landed on South Caicos Island (Fig. 1). This island, called *Guanahani* by the natives, was renamed *San Salvador* by the Admiral. Upon his departure from *San Salvador*, he visited and named *Santa Maria de la Concepcion* (now Mayaguana), *Fernandina* (now Acklin-Crooked), and *Isabela* (now Great Inagua). From the fourth island Columbus sailed to Cuba (which he called *Juana*), and then visited and named *Espanola* (Hispaniola) before returning to Spain. Though Columbus was never to return to the four small islands in the Bahamas that marked the Original Discovery, he returned to Cuba on the second and fourth voyages, and to Hispaniola on all three remaining trips to America. The magnitude, population, and apparent wealth of the two large islands attracted the Spaniards, whereas the four small (and goldless) islands seen by Columbus went uncharted. Among the Bahamas, today, a few of the 15th- and early 16th-century Spanish names survive, but during the 17th and 18th centuries many of the islands acquired the English names that appear on modern maps. It is futile to refer to old maps in an attempt to locate the first four islands seen by Columbus. Early cartographers invented both names and islands, and succeeding generations of mapmakers passed on these errors.

During the 19th century there was renewed interest in the First Voyage. As no maps correctly distinguished *San Salvador*, there was a scramble by historians to identify the island. Regrettably, each investigator first selected the island he thought was *San Salvador* and then attempted to defend his choice. With more than 700 islands and 2,000 cays in the Bahamas, there was an island for everyone! From among the countless *San Salvadors* suggested, only a few gained popularity. Emerging from the confusion was one overwhelming favorite, Watling Island. Watling became *the* first island because of the prestige enjoyed by those supporting its claim, and not because of any serious investigation or scientific proof. Several prominent British and American admirals agreed that Watling was indeed the site of Columbus' landfall. The Hakluyt Society of London concurred, and a Chicago newspaper erected a monument on the "exact location" in 1891. Most recently the army of Watling supporters added to its ranks Samuel Eliot Morison, whose influence cannot be underestimated. As a Rear Admiral and a Ph.D., his writings have been widely read and accepted as fact. In the last few years, and largely because of Morison, most maps have come to identify Watling as *San Salvador*. A few years ago the Bahamian government officially renamed Watling as San Salvador, and all recent maps so label it.

There is only one way to positively identify the *San Salvador* of Columbus, and that is through the application of geographical techniques. Prerequisite to the solution is the assembling of all materials pertaining to the First Voyage. This is rela-

tively easy, for the log has been well preserved. *(1-4)* Further, it is necessary to collect data on ocean currents in the Bahamas, navigational techniques of the 15th century, approximate magnetic variation in 1492, and characteristics of the three Columbian ships. The latter is significant, for the maximum height available to sailors on watch is one of the clues to the mystery. It must also be borne in mind that the Bahamas were heavily forested in 1492 and could be seen from a much greater distance than is possible today. It is also assumed that Columbus was an expert sailor, a good navigator, and a careful observer. He kept a reasonably accurate, if not complete, log. He was well-schooled in the Italian and Portuguese sailing traditions. He had journeyed from Genoa throughout much of the Mediterranean. From Portugal he visited Britain, probably Norway and possibly Iceland, and parts of northwestern Africa. For some years he lived in the Madeira Islands. There is no justifiable reason to suspect that his recorded experiences were distorted or corrupted, or that he was, as Morison suggests, unable to reckon latitude.

The author is not the first to collect such data and plot the voyage. Morison, and others of the Watling school, claim that they have done precisely this. But only one scholar, to the writer's knowledge, has taken Columbus at face value and has plotted meticulously the First Voyage. Retired Commodore P. Verhoog, of the Holland-American Line, published in 1954 an article that has gone almost unnoticed. *(5)* This came to the writer's attention while he was investigating discrepancies in the Fourth Voyage. Verhoog's proofs that Caicos was the first landfall were intriguing. Working with the same sources, the author was unable to find a single flaw in Verhoog's conclusions. The present paper, therefore, is in essence a defense of Verhoog's hypothesis.

Figure 1 is prepared from the original sources and should be used to follow the discussion below. Dotted lines on the map represent Columbus' route; solid lines indicate distances between certain critical points along the route. Figure 2 will prove helpful when comparing the theory presented here with that of the Watling school. Watling theory islands are lettered *A* (Watling, shaded black on the map), *B* (Rum Cay), *C* (Long), and *D* (Acklin-Crooked). The author's four choices are numbered *1* through *4*, and correspond to islands with the same numbers on Figure 1. The 15th-century sources tell us that:

> *San Salvador* is 60 miles long *(1)* and shaped like a beanpod. *(2)* It is about 20 miles west of the point from where Columbus observed a light on the night of October 11. This point of observation is 8 miles north of an island. *San Salvador* is heavily forested, flat, and very large. *(3)* There is a circle of reefs with a passage leading to a harbor large enough to accommodate "all the ships of Christendom" and the water there is as calm as that in a well. *(1, 3)* From *San Salvador* Columbus could see "so many islands that I have not been able to determine which one I shall go to first." *(3, 4)*

This description fits the Caicos group. Columbus saw the light while east of Caicos and north of Turks. It does not fit Watling in any respect. There is no island east of Watling and only Rum Cay can be seen from Watling on a clear day. Watling lacks the reef, the harbor, and is unapproachable from the east. And Watling is much too small.

> *Santa Maria de la Concepcion* is 28 miles from *San Salvador*. Its north coast extends about 40 miles in an east-west direction. At the west end of the north coast there is a cape. The island is surrounded by a beach, with rocks offshore. *(3)*

These facts match well with modern Mayaguana. The distance from *San Salvador* is correct, and though the length is not exact it is approximate. The beach and the offshore rocks are still present, as is the northwest cape. Rum Cay (island *B* of the Watling theory; Fig. 2) meets none of the necessary physical and locational requirements.

> *Fernandina* lies directly west of *Santa Maria de la Concepcion*, approximately 36 miles distance. It is between 80 and 112 miles long. The middle of the island should be hit by going directly west from *Santa Maria*. It is a very

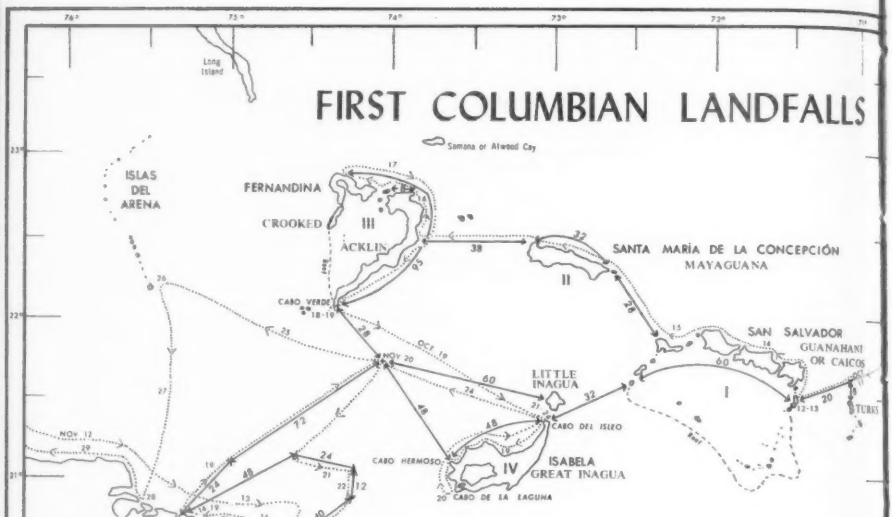

FIG. 1

large island and contains a magnificent harbor, large enough for 100 ships. The entrance to this harbor is 8 miles from the northeast corner of the island and there is a small island in its entrance. The western coast of the island runs southwest to northeast. At the southwest tip the cape was named *Cabo Verde* by the Admiral. *(3)*

This is a faultless description of Acklin-Crooked Island. It is correctly located with respect to *Santa Maria*. In no way does the description fit Long Island (*C* of the Watling theory; Fig. 2).

Isabela is southeast of *Fernandina* and much larger in area. Just north of the northeast cape there is a medium-sized island, with reefs north of the smaller island and between it and the larger. Columbus named this northeast cape *Cabo del Isleo*. From it the coast runs west-southwest for 48 miles. At this point there is a beautiful cape, called *Cabo Hermoso* by Columbus. The western coast is quite angular and there are some hills located near *Cabo Hermoso*. There is another cape on the southwest tip of *Isabela* with a large lake behind it. Columbus named this *Cabo de la Laguna*. The northeast cape, *Cabo del Isleo*, is 32 miles from *San Salvador*. On October 24, Columbus sailed from *Cabo del Isleo*

for 18 hours in front of a good wind. He then calculated *Cabo Verde* (southwest tip of *Fernandina*) to be 28 miles northwest of his position. On November 20, after sailing northeast 24 miles and northeast-by-north 72 miles from Port Tanamo, Cuba, Columbus reckoned that he was at about the same latitude he had been on October 24. From this point *Cabo Hermoso* lay 48 miles to the southeast. Further, the *isleo* north of *Cabo del Isleo* lay 60 miles away in an easterly direction. The position of Columbus on November 20 may be verified in another way. Because of unfavorable winds he decided to return to Cuba, which lay about 100 miles to the southwest. Later in the day, on November 20, Columbus stated that Port Tanamo was still 48 miles distance. To take advantage of the wind he turned east and sailed 24 miles, then south for 12 miles. At that location he was very close to latitude 21°N. Port Cayo Moa lay 40 miles to the southwest. *(3)*

These descriptions, measurements, and directions agree with remarkable perfection if Great Inagua is *Isabela* and Little Inagua is the *isleo* off the northeast cape of *Isabela*. The Watling theory, already shaken, collapses completely at *Isabela*. Watlingites hold that Acklin-Crooked is *Isabela*. Yet, there is no *isleo* off the northeast cape. *San Salvador* (their Watling; *A* on Fig. 2) is certainly not 32 miles east of the northeast cape. Watling is about 100 miles north-northwest of Acklin-Crooked. It is impossible to sail 100 miles generally northeast of Port Tanamo, Cuba, and be 28 miles southeast of Long Island (*C* of the Watling theory), 48 miles northwest of Acklin-Crooked (*D* of Watling theory), and 60 miles west of a non-existant *isleo*. Columbus said that islands three and four are 76 miles apart, but Watling supporters claim islands that are only 32 miles apart. The entire voyage between November 19 and 24 is senseless if one adheres to any islands other than the four specified at the outset of this paper.

With Caicos as *San Salvador* (*Guanahani*), the log kept by Columbus is revealed as an extremely accurate document. There is no need to interpret the Admiral, correct

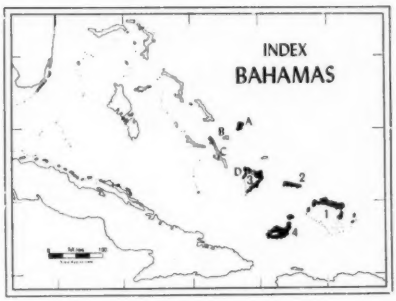

FIG. 2

and amend the log, or invent explanations for apparent discrepancies. Watlingites are forced to translate leagues as miles and clouds as islands, and in some instances are compelled to reverse the procedure. Distances, directions, shapes, sizes, and landscape descriptions are altered to make things fit the Watling theory (and others). Lengthy dissertations on the value of the Columbian mile and league are expounded to account for questionable points. But this is needless, for it is simply a problem of proportions. Mirages are invented by such authorities as Morison when reported facts fail to conform to their predetermined conclusion. It is regrettable and inexplicable why the greatest voyage in recorded European history is shrouded in myth and clouded by distortion. Caicos, unquestionably, was the first landfall of Christopher Columbus.

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(1) Las Casas, Bartolome de, *Historia de las Indias*, Fondo de Cultura Economica, Mexico, D.F., 1951, Libro I, pp. 195-241.

(2) ..... *Historia Apologetica*. Madrid, 1909, Chapter I.

(3) Navarrete, Martin Fernandez de, *Viajes de Cristobal Colon*, Espasa-Calpe, Madrid, 1934, pp. 23-87.

(4) Oviedo y Valdes, Gonzalo Fernandez de, *Historia General y Natural de las Indias, Islas, y Tierra-Firme del Mar Oceano*, Editorial Guarania, Asuncion, 1944, Tomo I, Libro II, Chapters V-VI.

(5) Verhoog, P. "Columbus Landed on Caicos," *United States Naval Institute Proceedings*, Vol. 80, 1954, pp. 1101-11.

THE GEOGRAPHIC EXPERT

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This is one of a series of guest articles written on invitation by senior members of the geographic profession.

THIS ARTICLE is designed to appeal particularly to the younger group of geographers and to young graduate students who are beginning or building a career in professional geography. It summarizes the present status of the field, the preparation needed to enter the profession, the financial and other remunerations to be expected, and the advantages and disadvantages associated with membership in the geographical fraternity. If this paper assists the neophyte in making wise choices and sound decisions as his career advances, it will have served its purpose.

Present status of the profession. The modern geographer has won an important place in business and professional life. His activities are no longer limited to classroom duties and to the exploration of distant lands. Although it is true that in both exploration of distant lands and teaching he has in recent years added much and stands higher than ever before, his work has won recognition in many other lines. The geographer has become recognized by businessmen; he is now accepted as a councillor in many of the great industrial and commercial plants of the United States. As illustrative of this, it may be mentioned that geographical experts are employed by many of the meat packing companies, iron and steel concerns, foreign trade corporations, and by some of the greatest American banks. During both of the World Wars the geographers of the United States were almost completely mobilized for war service in some form. No other group of professional men had a larger percentage of its membership engaged in war work than had the geographers, and, in the drafting of subsequent peace treaties, to them fell much of the task of recommending details of new boundaries of the countries affected.

The fields in which geographers work are numerous and varied but may be broadly classified into a few main groups, viz., exploratory, teaching, industrial, economic, and political. Although these fields cover widely divergent interests, the geographer carries into all of them the ability to view the regional problems with which they deal. It is his mission to interpret human resources and natural environmental factors, and thus point the way to sound economic development. To a large bank may come the question of advisability of assisting in financing factory development in a certain locality. The geographer consulted must be able to outline with reasonable accuracy the advantages and disadvantages of the proposed enterprise, particularly as to availability of raw materials, power, labor supply, and potential markets for the manufactured product. His work is fully as vital to the project as is that of the consulting engineer who must plan the mechanical details of a proposed factory. The geographer who specializes in foreign trade problems should be able to account for developments in given lines of international trade, and to make reasonable forecasts of market changes so as to guide purchases and sales along sound lines. Large importing and exporting firms are gradually adding experts to their staffs to do the work just outlined. Probably enough has been written to indicate the general breadth of the geographer's field. What about his training?

Preparation needed. Serious work in geography should begin in the freshman year in college. It should serve as an introduction that would enable the student to evaluate the content and the potential field in its cultural and professional aspects. During the early part of the undergraduate program, students with a desire for specialization should build their program to include basic courses in science, mathematics, and

social studies, and to include a continuation of foreign languages already begun in their high school studies. In the world of tomorrow, even more than now, reasonable proficiency in a foreign language promises to be essential for effectiveness in any professional field.

The need for an early introduction of geography in the college curriculum is due partly to the fact that so little attention is given this subject in high school, and partly to the complexity of the subject itself when studied from a mature point of view. Early courses should be devoted to physical and economic geography, and to regional studies of the United States and of the home state. While geography should thus be represented in the freshman and sophomore years in college, attention should also be given to laying a broad foundation of English, science, and foreign language. The junior and senior years of undergraduate training in geography should include studies of economic geography and the regional geography of Latin America, Europe, and the Orient, with a beginning of specialization in the phase of geography selected by the student as his core of major interest. The prospective geographer should early realize that he must select his minor work in accordance with the field in which he wishes to become highly proficient. This, of course, implies that if his work is to be along physiographic lines he must have thorough preparation in general geology, minerology, and land mapping, whereas if he desires to take up economic or commercial geography his most closely related work will be in the social sciences and history.

If fundamental courses have been wisely selected during undergraduate years, the student should be ready to begin serious specialization with his entrance into the graduate college. The candidate who desires to become a well trained geographer must devote attention toward developing proficiency in economics, history, sociology, and political science as well as acquiring thorough foreign language training. He must have a good groundwork in the sciences, for he uses their facts and principles continually in geographic interpretation. In short, no profession demands a more thorough and comprehensive foundation than does geography, and upon this foundation specialization can then be pursued along particular lines in which proficiency is desired.

Students contemplating careers in professional geography should bear in mind that the road to achievement is neither short nor easy. Those, however, who plan wisely and early and follow their plans persistently will be rewarded by entering a profession that is not overcrowded, and whose importance in a great many lines of business activities is just beginning to be realized.

Remuneration and opportunities for advancement. The question of remuneration and opportunities for advancement may well arise at the outset. For most people, the earning of a comfortable livelihood is a problem that is ever present and young men are in duty bound to consider it in selecting their careers. Professional zeal in some specific line may be ever so great, but unless financial returns are in keeping with the preparation necessary and the responsibilities involved the average young man will shun it. Only those who are financially independent can afford to omit consideration of probable recompense.

Large salaries should not be expected at the outset. As in most professions, the college-trained geographer must prove his ability in the school of experience before he can expect to win substantial recognition. Subordinate positions are steppingstones to success. Such positions in geographical lines may be an instructorship in college, the rank of assistant in research in an industrial or commerical organization, or a minor grade station in foreign service. Initial salaries vary, and ordinarily are but slightly greater than necessary living expenses in connection with the position.

Advancement in the profession is very largely dependent on the candidate himself. The qualities demanded are initiative, industry, and proficiency in handling the work of the day. Errors of judgment will occur but the general batting average must be high. Advancement comes as a reward for meeting promptly the problems that arise, and the possibilities that may be realized are almost without limit.

In collegiate work, full professorships in geography carry salaries ranging from $8,000 to $15,000 per year. Nearly all large

universities have established geography departments, and the number is being rapidly extended into the smaller colleges as well. One of the attractive features of this line of work is the opportunity offered for research and publication. Success here leads to permanent scientific recognition; men and women of proven worth are always in demand within as well as without college circles. Because of their general interest and wide appeal, geographical publications often prove valuable for their royalties. A number of the authors of geographical textbooks are enjoying substantial incomes from sales of their publications. This situation may be considered permanent, for the young men of today will become the textbook writers of the next generation. Some of them will profit thereby both scientifically and financially.

In the industrial and commercial world geographical experts are paid from about $2,500 to $15,000 per year depending on the standing of the men, the responsibilities placed upon them, and the results they have achieved for their employers. In general, the pay is better than in college work but the tenure of position is less certain. One of the most attractive phases of the geographer's work in business lines is the opportunity for travel that is generally afforded. Commercial concerns frequently send their geographical experts into a foreign country, or a section of the country, to be studied. This is done so that they may acquaint themselves directly with problems that confront business in the field, and they are expected to interpret the situation promptly and accurately. These studies carry the investigator above his own narrow viewpoint and inevitably lead to larger world vision, a situation that is pleasant personally and broadening professionally.

Another attractive phase of the geographer's work in commercial lines is the business training involved. Investment propositions and business development problems are constantly being studied and these must be solved wisely in order to succeed. Experience thus gained becomes highly valuable and in many cases leads into the realm of independent business. The possibility of developing individual enterprise should be considered as being one of the most inspiring phases of the profession, for that carries with it economic well-being and social recognition. Thus the field is one of promise, whether the fulfillment lies in advancement to responsible positions with large corporations or in successful private careers.

Summarizing, the financial return of the salaried geographer may be considered as ranging from $2,500 to $15,000 per year in both collegiate work and corporation employment. Opportunities for materially increasing income are available in both lines; their realization depends on the initiative and capabilities of the individual.

Advantages and disadvantages. Before deciding upon a career the student should weigh carefully its possibilities and limitations. The question, "What are the rewards of success and what are the handicaps to be overcome?" may well be considered by prospective geographers.

Let us consider at once the disadvantages. First may be mentioned the prevalent idea that geography is only an elementary subject. To some people a mathematical expert or a literary expert seems natural because arithmetic and reading are cloaked in new terms, but geography is not blessed with a multiplicity of names that have won wide acceptance. Second, although geography is an old subject, in its present conception it is new. Its workers are still to some extent in the pioneer stage; the fruitage of their labors has not been generally recognized. They have before them the task of proving their value in many fields as yet untouched, but progress in the face of the conservatism of established customs is slow.

Then again, opportunities for effective specialization in geography have until recently been comparatively few. Only a small percentage of colleges and universities in the United States offer the instructional and research advantages essential to mastery of the subject.

By some, the fact that the profession is not large in numbers would be considered a disadvantage. Great increase in numbers is not expected; neither would it be desirable. The field is gradually being extended and, as its merit is proven, more members to care for the work will be needed. At present there is a scarcity of well trained

men and women, a condition that seems likely to prevail for some years to come.

Among advantages, some have already been mentioned, such as opportunities for travel and business training. But of even greater significance is the fact that the geographer, because of the newness and vastness of his subject, frequently experiences the thrill of discovery. There is pleasure of the finest type in discovering new lands, learning new things about lands already known, or determining geographic influences hitherto unrealized. Extending the boundaries of the field of human knowledge is a very important part of the geographer's work; he therefore holds a dignified position among those engaged in scientific research.

Then again, the field of study to which the geographer must devote himself is one that is conducive toward broadmindedness. He must be able to work out details of small areas and to see the effective factors in large areas. He must be able to comprehend the fundamental conditions that affect development of regions, and be able to reason from such conditions to their economic and social consequences. His problems are varied, ranging from those relating to some business phase of a small area or industrial unit, to those concerned with international relations. This compels the geographer to become a student with ability to concentrate on specific problems as well as to make broad generalizations as occasion may demand. This ability makes him valuable, not only from a business or economic point of view, but also from the standpoint of broadminded citizenship.

Conclusion. The above should help us to appreciate that the well trained geographer has a distinct and honored place in professional life. He is needed in business, and businessmen are gradually coming to recognize the fact. Many large manufacturing and banking corporations consider the geographer as an essential member of their advisory staff. A number of geographers hold responsible positions in the Departments of State, Commerce, and Agriculture at Washington. Finally, the importance of college opportunities should not be overlooked. College instruction in geography is increasing and there is now a scarcity of well trained men for openings available. The work is not easy, nor does preparation for it end with attainment of any particular degree. Intelligent study constantly pursued is the price of success. But the work is fascinating because the problems deal with live issues and are ever new. To solve them means valuable contributions to society in its economic and social aspects. Success thus achieved is lasting.

ANIMAL GEOGRAPHY IN GEOGRAPHY TEXTBOOKS: A CRITICAL ANALYSIS

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THE PURPOSES of this article are (a) to review critically the treatment presently given to faunal, historical, and ecological animal geography *(1)* in basic college geography textbooks now being widely used in the United States, and (b) to suggest some changes and improvements which might bring the treatment of animal geography in such books up to a professional level comparable to that usually characteristic of other systematic aspects of physical and biological geography, e.g., landforms, climate, soils, vegetation.

The present situation. Fourteen books currently being employed as first year college geography textbooks were examined to determine their zoogeographic content. No textbook which was obviously restricted to economic geography was included since cultural animal geography content was not being evaluated. In an effort to avoid what might be considered unfair comparisons, no reference to a specific geography textbook author or title is given below.

Geographers almost to a person will without question include native animal life or

some similar designation in a list of physical and/or biological elements of geography. However, it appears that there is reluctance on the part of some college geography textbook authors to include the subject in their textbooks or, having decided to include the subject, they are unwilling or unable to give it a quality of treatment which compares favorably with other portions of the book.

Of the 14 books examined, 10 include at least some discussion of animal geography and four do not. Eight of the 10 books show markedly inconsistent treatment of the subject, each book being considered separately. For example, animal life (or a similar heading) appears in some regional sections or chapters of a text and yet is inexplicably absent from other parts of the same book.

A comment is encountered in several texts to the effect that animals are so mobile that their distributions cannot be generalized upon as can the distributions of plants. This is not quite the case, however. Since 1876, geographers have had maps available on which the earth is divided into a series of large faunal regions, usually six in number. The level of generalization of such maps is comparable to soils and vegetation maps which have for a long time appeared in our geography textbooks.

Lumping animal species together in such a manner as to confuse the reader on the matter of distribution for an individual species occurs in seven of the books. For example, the geographically untrained reader (and one must presume such will be the case with most first year geography students) might have to conclude in one instance that there are jaguars in Africa and tigers in South America. Such confusion is bound to result when an author discusses animal life without giving proper regard to possible distinct differences in the distribution of individual animal species.

There is an unfortunate tendency to generalize to such an extent, when writing about native animal life, that the student can derive little of value from the section. This tendency is found in seven of the books. This admittedly is a somewhat subjective area to criticize, but it is clear to the writer that much more meaty and concise treatment is possible and desirable in many cases.

Errors in biological information are found in five of the books. The errors differ in nature, and only three examples are given here: baboons in one case are described as being arboreal animals when in fact they are ground dwellers; tree sloths are said, in another case, to be absolutely helpless on the ground when in fact they can not only move on the ground but are also good swimmers; whales are characterized simply as fish eaters when in fact many species of whales feed on minute animal life, others feed upon squid as well as fish, and killer whales, *Orcinus*, prey upon seals, other whales, and also eat fish.

A degree of taxonomic carelessness is found in four books. Examples of such errors include the following. Termites are referred to as white ants, or, in one case, as "a kind of destructive wood worm." Termites are neither ants (Order Hymenoptera) nor worms (several phyla), but belong instead to a group of insects called Order Isoptera. The tuatara or spenodon, a curious reptile having a very limited range in New Zealand, is in several instances referred to as a lizard. Although the reptile looks very much like a lizard (Order Squamata) it in fact is the sole survivor of a different order of reptiles, Order Rhyncocephalia. Spiders are several times referred to as insects (Class Insecta), but spiders belong to Class Arachnida; and rabbits are sometimes called rodents (Order Rodentia), but really belong to Order Lagomorpha.

Three books contain at least one error in animal distribution. Examples of this type of mistake include: spiny anteater and wallabys are said to be restricted to Australia but in fact occur in New Guinea as well; alligators are stated to occur in tropical monsoon climate areas, but this reptile occurs only in southeastern United States and the lower Yangtze River area of China.

Errors in the employment or lack of employment of accepted biological terminology are found in three books. Examples include: the term animal is used as a synonym for mammal; the term family is used erroneously, as for instance in rodent family, when rodent order is called for since the term family has quite another taxonomic value.

In a number of instances, descriptions of

natural history phenomena are exaggerated in a fashion not appropriate to a college text. The tendency in this area is to enlarge upon snake numbers in tropical forests and to dwell at length on the fierceness of wild animals.

To summarize, the chief criticisms which this writer directs against the ways in which animal geography is treated in our college geography textbooks are as follows: (1) the inconsistency of treatment in a given book; (2) an entire lack of treatment; (3) the absence of a zoogeographic map of the world; (4) the lumping of animal species so as to cause confusion as to the actual distribution of individual species; (5) extreme generalization in treatment; (6) errors in biological information; (7) carelessness in taxonomy; (8) errors in animal distribution; (9) errors in use, or lack of use, of accepted biological terminology; and (10) exaggeration of descriptions of natural history phenomena.

Suggested improvements. It is hoped that the reader will agree that more care and attention to the treatment of animal geography in our college geography textbooks is highly desirable. In an effort to bring about such desired changes, several items are offered below for consideration.

Until such time as writers of geography textbooks give biogeographic topics consideration equal to that presently given to topics in physical and cultural geography, animal geography undoubtedly will continue to appear in the "physical" portions of those texts which are organized on a systematic basis. However, this should in no way prevent authors from giving the subject proper treatment. For texts which are organized on a regional basis, the problems are different and will be discussed below.

For systematically organized texts, it is first suggested that a map showing the major zoogeographical realms (or regions)—Neotropical, Nearctic, Palearctic, Ethiopian, Oriental, Australian—be included as standard equipment. Using this map as a basis for discussion, the author can first say something about some animal species which are characteristic of each large realm.

After describing large regional faunal patterns, the author might then proceed to discuss some of the historical occurrences which have contributed in significant ways to produce contemporary animal distributions, e.g., the Panama land bridge and its significance in terms of contemporary faunal patterns of the Neotropical and Nearctic realms.

Third, using the same large regional units as a foundation, the author can discuss different aspects of ecological animal geography. Intricacy of treatment here must be governed by the scale given to preceding discussions.

The length of the treatment of animal geography, as briefly outlined above, will naturally differ according to inclinations of individual authors and limitations of space.

Authors of geography textbooks that are organized on a regional (physical or cultural) basis have a more difficult problem, particularly if regional units are relatively small, e.g., Mediterranean Forest Lands or Western Europe. In the former case, the regional unit has a disjunct global distribution and occurs in five different major zoogeographical regions, viz., Palearctic, Ethiopian, Australian, Neotropical, and Nearctic. In the latter case the regional unit constitutes only a fraction of a very large animal realm—the Palearctic.

For cases in which the regional unit includes parts of more than one major zoogeographical region, it would be best to divide the animal discussion into as many parts as there are zoogeographical regions represented. In many instances only a faunal treatment will be possible due to limitations of space, but this should be carefully done so as to prevent the errors and confusion noted above. Mention should be made of zoogeographical regions represented, and a world map of the regions should appear in the text.

In the case in which the regional unit is but a part of a larger zoogeographical region, the author might include succinct descriptions of faunal components of the cultural region but not include remarks on ecological or historical animal geography unless space permits. Some authors apparently fear repetition here, but discussions of soil, climate, vegetation, and so forth must also be repeated and there is no logical reason that this cannot or should not be done for native animal life.

With regard to accuracy of content, it is suggested that the section(s) on animal

geography be checked as critically by the author as he is accustomed to checking other parts of the text. Most libraries contain basic references with which distributional information, names, and biological information can be verified. *(2)*

Conclusion. The inadequate treatment of animal geography so often encountered in our college geography textbooks may be attributed in large measure to the lack of attention given to zoology during the early training period of geographers. Although beginning courses in geology, geomorphology, anthropology, economics, and botany are often urged upon students majoring in geography, the writer is not aware of a situation in which similar urging is directed toward a first year course in zoology. If students were to be so encouraged, it would ultimately do much to improve the quality and quantity of animal geography in our geography textbooks.

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(1) For brief descriptions of these divisions see: Bennett, Charles F., Jr., "Cultural Animal Geography: An Inviting Field of Research," *The Professional Geographer*, Vol. XII, No. 5, Sept., 1960, pp. 12-14.

(2) Some suggestions: Allee, W.C., Emerson, A.E., Park, O., Park, T., Schmidt, K.P., *Principles of Animal Ecology*, W. B. Saunders Co., Philadelphia, 1955; Allee, W.C., Schmidt, K.P., *Ecological Animal Geography*, Second Edition, John Wiley and Sons, New York, 1951; Darlington, P.J., Jr., *Zoogeography: The Geographical Distribution of Animals*, John Wiley and Sons, New York, 1957; Simpson, G.G., *The Principles of Classification of Mammals*, Bulletin of the American Museum of Natural History, New York, Vol. 85, 1945.

SOME FIELDS OF RESEARCH IN ECUADOR

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IN RECENT years there has been increased interest in Latin America among geographers, and a large number of colleges in the United States now offer programs in Latin American studies. The recent International Geographical Union conference in Rio de Janeiro stimulated yet further interest among both North American and British geographers.

It is surprising, however, that the attention of geographers has tended to concentrate on a few regions within Latin America. Mexico and Brazil, respectively the nearest and the largest of the constituent countries, have received the lion's share of recent research activity. Preparing for a summer's field work in Ecuador last year, it was disconcerting to find how small was the body of academic knowledge about that country. Though indubitably among the smaller nations, Ecuador is now the world's leading exporter of bananas, and it has been at one time or another an important source of cacao, balsa wood, and Panama hats. Few people have ascended Ecuador's snow-covered peaks since Whymper climbed most of them 80 years ago; and tourists travel posthaste to Peru's historic cities of Cuzco and Lima with little time to spare for a country whose associations with the Incas were transitory. Unlike some South American nations, Ecuador cannot boast a recent revolution which would bring it to the attention of the outside world. Indeed, in recent years there has been a tendency for Ecuador to be forgotten and neglected both by the general public and the academic world. The bibliography at the end of this paper is a summary of works of geographic significance, and the paucity of entries therein tells its own tale.

Yet, for all this, Ecuador is the only country on the west coast of the continent with a sizeable area of tropical coastal plain, mountains, and interior lowlands. It thus combines problems of the humid tropics with those of the high Andes. In this paper, it is hoped to present a summary of the problems which two thousand miles of travel in the country has made seem important

to the writers, and which should be of significance to geographers.

Problems of Sierra-coast relationships. An analysis of the patterns of trade and traffic between Sierran and coastal parts of Ecuador should be of interest and value. The steady improvement of communications between the coast and the Sierra has of late stimulated increased movement. One wonders whether this movement is one of commodities, and how interdependent the two zones have become. Is the traffic perhaps one of people moving from the impoverished Sierra to the growing lands along the coast?

The zone of transition between mountains and coast has not been adequately studied in any country of western South America; yet, in Ecuador, it is an area of national importance. Is it more common for the *montuvios* of the coast to infiltrate up the valleys, adapting their crops gradually to the changing environment; or, rather, are the Sierran folk moving down the valleys? The authors encountered examples of both types of movement in Ecuador. Furthermore, is distribution of major crops controlled by climate, i.e., limits of altitude; or is it, rather, determined by customs and traditions of the people? Sierran Indians probably leave sugar cane cultivation to mestizos and Negroes. The study of valleys along the western side of the Andes, in particular those of the Jubones and the Chimbo whose bottoms show uniform gradation from tropical forest to montane grassland, might reveal something of the relationships between climate, tradition, crop, and cultivator.

In the Sierra, itself, there is still much work to be done in determining different levels of cultivation for crops in various areas. James (see bibliography), presumably applying what is true in Colombia, states that "The Basin of Tulcan . . . lies at an elevation of 9,500 feet and is, therefore, too high for any crops except the potato." In this area, as a matter of observation, good crops of barley and wheat as well as corn are grown. Thus, it is likely that agricultural traditions, as well as physical conditions, play a part in determining the highest altitude at which a crop is grown.

Problems concerning areas of potential development. So often the geographer seems to play a part only in remedial action. One could well argue that it would be of greater benefit to the profession, and to society as a whole, if instead his efforts were directed toward the study of areas where new developments and settlement are likely to be made in the future. In the case of Ecuador, excellent preliminary work in this field has been done by Luscombe and Pereira, and three topics in particular seem appropriate for further investigation.

Within the last few years a railroad has been completed from Quito to the village of San Lorenzo on the coast. It is hoped that this will assist development of the area through which it passes and that San Lorenzo, where construction of a first pier was scheduled for completion in November 1960, will become an important banana port. Settlement indeed has already begun and is being controlled by the Government; but the nature of the settlers, and the stage of development of the area and of the terminus town at present, are worthy of study as a pioneer area.

Dynamic population groups in Latin America are sufficiently rare to be noteworthy, and two groups of Sierran Indians in Ecuador are especially distinctive. In the south of the country the Saraguro, probably an Inca *mitimae* group, are expanding southward. There are said to be regularly taking their animals over the Cordillera Oriental to graze on lush pastures of the lower mountain slopes of the tierra templada. This is of significance, both because Sierran Indians are normally characterized by a conservative dislike of leaving their mountain basins, and because any use of the grazing lands on the Oriente side of the mountains is unusual. As these people are easily recognizable by their short black pants and their all black costume, their distribution could be quite easily plotted. Farther north, the Otavalo, one of Ecuador's better known groups of Indians, travel all over the west of the continent selling the fine textiles of their region. It would be interesting to investigate the motives which have led members of this group to travel as traders so far beyond their homeland, and to ascertain their methods of journeying and the routes normally followed.

Problems of the Sierra. To a large extent the problems of the Andes in any one area may be duplicated in many other parts of the same mountain system. This makes any study of fundamental importance in the Ecuadorian Sierra all the more meaningful.

Throughout the whole of highland Ecuador, the recurrent and dominant problem facing the farmer is aridity; in some areas, water is channeled over 50 miles for irrigation. Present remedial efforts associated with the Government's *Caja de Riego* have thus far been of little importance. For example, villages at the foot of Mt. Chimborazo, a few thousand feet below permanent snow, suffer severe water shortages. No study exists concerning the distribution of available water in relation to potentially irrigable land, and any research in this field would be of the utmost immediate and practical value.

Though not a specific *problem* of the Sierra, the geography of its towns is well worthy of study. The larger ones are all over 400 years old, dating from Conquest times, and they possess a certain physical uniformity. The urban geography of these towns, and the extent of their respective hinterlands, both are sufficiently static for a comparative study to be made which would be applicable over much of the Andean area and of some significance to the settlement geography of the continent.

An unusual problem in political geography exists in the division between Ecuador and Colombia of the upland basin containing the towns of Tulcan and Ipiales. A study of the development of the Ecuadorian and Colombian sides of the basin might help to show whether, as has been suggested, the political division is of economic significance in development of the area, or whether the boundary merely provides an additional source of income to the smugglers of Tulcan.

Problems associated with the banana industry. Finally, and by no means of least importance, the banana industry affords problems of interest to the geographer. As has been intimated, the banana is Ecuador's chief claim on the memory of the present generation of college students. Despite a recent article by Parsons, relatively little is known about the industry. This is remarkable because, unlike most other producing areas in the hemisphere where the industry is a quasi-monopoly of the hemisphere fruit trade, most bananas in Ecuador are produced on private holdings. However, the size of these holdings, their distribution, and the degree of control that the fruit companies exercise over them (in the way of providing insecticides and spraying equipment) are incompletely understood and have not been adequately described.

A major obstacle to the solution of these problems, of course, is the matter of inadequate statistical source material on the industry. Such census figures as exist are rightly treated with circumspection. However, a number of local organizations (e.g., Ecuador) possess more accurate statistics, and the helpfulness of these officials in supplying figures and information knows the Asociacion Nacional de Bananeros del no bounds.

Conclusion. Ecuador is beset by many problems, but they are of such varied nature and cover such a wide range of activities that any studies in that country are likely to have relevance in many other parts of the continent, as well as benefiting Ecuador itself. A brief perusal of any of the sources listed in the selected bibliography that follows should indicate to the reader the inadequate and incomplete nature of what is known about this small country.

SELECTED BIBLIOGRAPHY

General Texts

James, P.E., *Latin America*, Odyssey Press, 3rd Edition, 1959, pp. 142-160.

Platt, R.S., *Latin America, Countrysides and United Regions*, McGraw-Hill Book Co., 1942, pp. 256-266.

Travel and Exploration

Blomberg, R., *Ecuador: Andean Mosaic*, Gebers, 1952.

Franklin, A.B., *Ecuador: Portrait of a People*, Crowell, 1943.

Whymper, E., *Travels Amongst the Great Andes of the Equator*, John Murray, 1892.

Serious Description

Collier, J. and Buitron, A., *The Awakening Valley*, University of Chicago Press, 1949.

Linke, L., *Ecuador*, Royal Institute of International Affairs, 3rd Edition, 1960.
Parsons, E.W.C., *Peguche, Canton of Otavalo, Province of Imbabura, Ecuador: A Study of Andean Indians*, University of Chicago Press, 1945.
Wolf, T., *Geografia y Geologia del Ecuador*, Brockhaus, 1892.

Geographical Sources

"Andean Mission of the United Nations, and the Government of Ecuador," *Integration of the Native Indian Population in Ecuador*, Riobamba, Ecuador, January, 1960 (duplicated).
Burt, A.L., *et al.*, "Santo Domingo de los Colorados—A New Pioneer Zone in Ecuador," *Geographical Review*, Vol. 36, No. 3, July, 1960, pp. 221-230.
Ferdon, E.R., *Studies in Ecuadorian Geography*, School of American Research, Monograph No. 15, University of Southern California, 1950.
Garcia Solorzano, A., "Ecuador and Its Present Natural Resources," *Proceedings of the Inter-American Conference on the Conservation of Renewable Natural Resources, Denver, 1948*, Washington, 1949.
Luscombe, D.T. and Pereira, M., *Informe al Gobierno del Ecuador sobre Colonizacion*, Food and Agriculture Organization and International Labour Organization, Rome, 1957.
Miller, E.V., "Agricultural Ecuador," *Geographical Review*, Vol. 49, No. 2, April, 1959, pp. 188-207.
Parsons, J.J., "Bananas in Ecuador: A New Chapter in the History of Tropical Agriculture," *Economic Geography*, Vol. 33, No. 3, July, 1957, pp. 201-216.

A TECHNIQUE FOR PRODUCING COLORED WALL MAPS

Randall D. Sale

The University of Wisconsin

WALL-TYPE illustrations for many general subjects are available from commercial concerns, but sometimes they do not meet specific needs; for example, the size may be unsuitable, lettering may be inappropriate, or superfluous information may be included. In other cases, needed maps or charts may not be available commercially. One may desire a wall-type enlargement of a textbook plate, or a map showing specialized or up-to-date information. The pedagogical quality of a lecture, or series of lectures, may be considerably enhanced by a matched group of illustrations in which color and design are consistent throughout.

Because of difficulties (anticipated or previously encountered) in the preparation of good quality, durable maps and charts, that are desired but are unavailable commercially, most persons decide to do without or to take second best. The purpose of this paper is to describe a technique by which one with even little artistic ability can prepare attractive large illustrations in color at a minimum cost.

The total cost normally will exceed that of commercially produced illustrations printed and mounted in quantity in an assembly line operation. But if duplicate or similar copies are made according to the method presented here, the cost per copy will decline. Further, at educational institutions it is sometimes preferable to utilize student-cartographers, and thus to further their training, rather than to purchase commercial items that are not specifically designed for the purpose needed.

Hand-made vs. mass-production maps. Preparing a colored map for display is unlike drafting one for printing. Artwork for printing can be done on a variety of materials which have good drafting surfaces and on which corrections can easily be made. At the film stage there is still an opportunity to make changes or to correct errors. But material for hand-made maps must be durable enough for wall map use

or suitable for mounting on cloth. Surfaces of such materials are often unfit for drafting; making corrections can cause irreparable damage.

Color can be applied to individual maps in a variety of ways; however, it is not possible to attain the smooth flat color of printed maps with most hand-applied media. When using colored pencils it is difficult to achieve uniformity, although on some surfaces they work satisfactorily. Application of ink or water color with a brush requires considerable skill. Opaque colors such as tempera, which are easy to apply, have the disadvantage of covering the linework. One can produce excellent color using an air brush, but a flat, firm material most desirable for air brush work probably cannot be rolled, and the job of masking and spraying is difficult and time-consuming.

The method presented here for producing one's own wall maps utilizes materials and a duplicating process in a way that avoids most of the difficulties mentioned above. Corrections can easily be made; the drawing can be done on translucent material, permitting tracing from other maps; color can be applied quickly and smoothly; and prepared lettering and patterns can be used. What is more—and this is perhaps its most attractive feature—this method makes it relatively simple to do a series of duplicate or related maps by having multiple copies of the base map information printed by the Ozalid process, thereby reducing the cost and time involved in making many similar maps.

Let us assume, to illustrate the full potential of the procedure, that we are making a series of maps.

The method. The base information, i.e., only that which is to appear on all maps of the series, is drafted with black ink on translucent material such as tracing paper or tracing linen.

Normally the base information will include the coastlines, and a selection of political boundaries and rivers. The design may allow space for a legend and title, or these may be placed on the final individual copies outside the map border.

Because the Ozalid process requires clean, translucent copy with only those areas opaqued which are to be printed, corrections on the original base must be by removal rather than by covering with white opaque. Unwanted lines can be removed from tracing paper or linen by first scraping with a knife and finishing with a medium hard eraser. With care, new lines can be drafted on this disturbed surface.

Lettering on the base can be applied freehand with brush or pen, by mechanical means, or by using prepared stick-up. Because heat is involved in the reproduction process, prepared stick-up patterns and lettering must have special adhesives that resist the heat of the Ozalid machine. For this purpose the Monsen Company *(1)* offers H-R (Heat Resisting) Trans-Adhesive Map Type. A special adhesive combined with heat resisting acetate prevents melting, slipping, and peeling. Burnishing is all that is required to fasten the type to the copy. The Para-Tone Company *(2)* produces Blue-Zip, which is available in a variety of patterns and screens. It is applied to the copy the same way as is Zip-A-Tone and will withstand temperatures of 300° F.

The completed base is used to produce black line copies on Ozalid Cloth-Backed Paper *(3)*, which is ideal for wall map use because of the sharp black image which it yields as well as for its durability. It is suggested that small pieces be run as trials since it has been found that this material produces the best image when run much more slowly than ordinary Ozalid paper.

Cloth-Backed Paper is available in a variety of sheet sizes up to 24 by 36 inches, and in rolls measuring 10 or 20 yards by 42 inches. Cost of the material in the larger roll is approximately 15 cents a square foot.

On a cloth-backed copy, special information such as areal boundaries, titles, and legends are added using ordinary drafting pens and inks. At this point corrections are a source of bother because alteration of the surface can interfere with the application of color.

An alternate method is to add linework for individual maps of the series on Ozalid Intermediates produced from the original base. The Intermediate is an Ozalid copy on translucent paper from which subsequent copies can be run. The image appears in sepia or brown, and is usually a reverse image which "reads right" from the reverse

side of the paper. Additional information is added to the side away from the image. Subsequent copies run from this intermediate have a combination of the sepia image and of lines, lettering, or patterns which have been added.

The completed intermediate is then used to produce the cloth-backed copy. Translucence of the intermediate paper makes for easy transfer of information. Corrections are still possible because color will be added to a later cloth-backed copy. Lettering and patterns need not be done with ink since the heat resisting materials mentioned above are available.

Finally, color is applied to the completed cloth-backed map. Ordinary artists' oil paints have been found to be most satisfactory. Color can be applied evenly and the result is permanent. Repeated rolling and unrolling will not cause the paint to crack or peel since only a thin film of oil is applied, part of which penetrates the surface of the map. A variety of color effects can be produced by mixing pigments and by the addition of black or white. Color is used directly from tubes without the addition of drying agents or thinner. Enough color should be mixed to complete a given map in order to insure consistency. The paint is applied with an absorbent cotton swab, and precise work is possible if the cotton is twisted on the end of a small stick. Q-tips, available at most drug stores, have proven to be satisfactory. Paint should be applied first near the center of an area and spread toward the bounding line. This prevents color from building up in a position where it will be more difficult to smooth. Near the edge of an area a smaller twist of cotton may be necessary for more careful control. Final smoothing of the color is accomplished in reverse, starting at the bounding line and working toward the center. An art gum eraser is recommended for removing paint which has gone over a line into another area. A hard eraser will damage the sizing of the surface, leaving an area on which further painting will be difficult.

After painting, the map should be hung in a clean dry place. The oils dry slowly, different colors requiring from three days to two weeks. During this time the map can be used, but rolling may cause the paint to smear. Trimming the map sheet to insure rectangularity is necessary before adding half-rounds. If all corners are not square, the map may not roll straight. The map is first attached to one of the half-rounds with a stapler. Wire brads can then be used to fasten the two half-rounds together. Ribbon may be attached at the top to hold a ring for hanging and to tie the rolled map.

The cost of producing large colored illustrations on Ozalid Cloth-Backed Paper varies with size and complexity. Larger size and increased complexity require more drafting and more labor in applying color. Since it is not necessary to mount paper on cloth, the job is simplified and the result is usually neater. The real saving is in labor, since multiple copies are made from a single base, and application of color is easy. The result is a unique product of superior quality.

* * *

(1) Monsen Typographers, Inc., 22 East Illinois Street, Chicago 11, Illinois.

(2) Para-Tone Incorporated, 512 West Burlington Avenue, LaGrange, Illinois.

(3) Ozalid Division, General Aniline and Film Corporation, Johnson City, New York.

A SIMPLIFIED TRAFFIC FLOW MAP

David E. Christensen
The Florida State University

A RECENT brief article in *The Professional Geographer* presented an alternative to the usual width-of-line method of depicting traffic flow. (1) Detailed studies might successfully employ either of these techniques. However, a simplified

system was designed by the writer in making an easy-to-read map of Florida traffic flow (Fig. 1) for a general atlas of the state. (2) This simplified system appears to offer some advantages for certain uses.

Maps depicting traffic flow by numerical groups with distinguishing patterns are simpler to construct and easier to read than maps constructed by either the standard method or the dot method described by Schultz. If more detail is desired than is shown in Figure 1, the number of groups can be increased and the numerical range of each group narrowed. Maps made by this simplified method would appear to be most useful in showing the general pattern of traffic flow; their chief disadvantage is that more specific data would have to be obtained from other sources.

• • •

(1) Schultz, G.M., "Using Dots for Traffic Flow Maps," *The Professional Geographer*, Vol. XIII, No. 1, January, 1961, pp. 18-19.

(2) Becker, H.F. and Christensen, D.E., *Florida Reference Atlas*, Dixie Publishers, Tallahassee, 1960, p. 56.

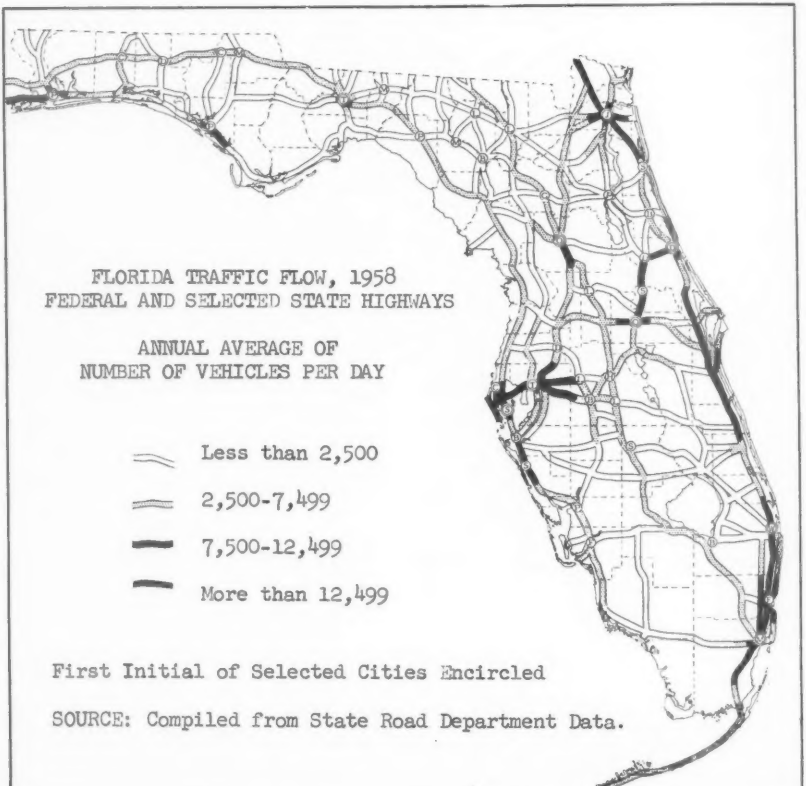

FIG. 1

ASSOCIATION AFFAIRS

REPORT OF THE COMMITTEE ON MASS DATA PROCESSING TECHNIQUES

During the past year a survey was made of research projects in which geographers had used mechanical aids either to deal with large quantities of data or to perform complex calculations. The survey was authorized and supported by the AAG Council, and was conducted by the Committee on Mass Data Processing Techniques. It was carried out by means of a postcard questionnaire sent to members of the Association.

Objectives of the survey were: (1) to determine the extent to which geographers are using mass data processing techniques; (2) to determine availability of information already prepared for processing and of computer programs; and (3) to stimulate other geographers to use data processing techniques by making them more aware of the range of problems to which these techniques may be applied.

The first objective was only partially achieved. It cannot be assumed that the survey produced anything approaching a complete list of projects on which geographers have used mass data processing techniques. Only about 120 replies to the questionnaire were received, and some AAG members who are known to be employing the techniques extensively did not reply. It would probably be impossible ever to compile a complete list, but, if suggestions to be made later in this report are followed, the Committee may be able to approach it more nearly.

The survey did reveal that there is considerable information already punched into I.B.M. cards which would be made available to any researcher who could use it. Almost every geographer who reported using these techniques expressed a willingness to make his material available on request. Certainly, much information has been entered in a form which is useful only for the original study; but equally certainly, some of it can be more widely useful. This is particularly true if the values of comparability are rated more highly than ideal categorization. It seems unlikely that a wide scope exists for exchange of computer programs. A very large majority of replies reported the use of standard programs which are widely available; most of the rest are too unique or specialized to be applied to even a similar problem.

If others in the profession react as have members of the Committee, the final objective of stimulation will have been achieved. The range of problems successfully attacked by mass data processing techniques is so wide that it seems nearly impossible to conceive a problem for which their use does not at least require consideration. In order best to convey this impression of nearly universal applicability, it was thought desirable to list all projects reported rather than merely to analyze and categorize them. It is suggested that a listing such as this be repeated at appropriate intervals, in order to continue to bring newly prepared data to the attention of the profession and to stimulate new projects through knowledge of successful utilization by others. A regular service, such as that rendered by Hewes in listing theses, is envisioned. Preparation of such a list annually might be made one of the duties of this Committee. Problems facing geographers in making best use of these new tools are too great for the profession to allow itself more than the irreducible minimum of individual trial and error.

The listing which follows reports subjects of study rather than final titles since many reports have not yet been published. The location reported for each individual is that

from which his reply to the questionnaire was sent. In most cases, replies to the questionnaire reveal little more than the information here included, so any requests for elaboration should be addressed directly to the persons reported as doing the research.

RESEARCH PROJECTS INVOLVING USE OF MASS DATA PROCESSING TECHNIQUES

Alexander, John W. (University of Wisconsin): multiple correlation of criteria measuring the location of manufacturing; the economic structure of American cities, 1950.

Anderson, James R. (University of Florida): physical characteristics of land and land use (for U.S. Department of Agriculture).

Anstey, Robert L. (Quartermaster Research and Engineering Command, U.S. Army): world-wide compilation of environmental data.

Applebaum, William (29 Tobev Road, Belmont 78, Massachusetts): the measurement of a retail trading area.

Becht, J. Edwin (University of Houston): prediction of electric power consumption for new residential developments; choice of warehouse locations; manufacturing in the Houston area.

Berry, Brian J.L. (University of Chicago): urban business structure; factors affecting urban land values; relative economic development of 95 countries; the urban occupancy of flood plains and seasonality of flooding; central place studies.

Blair, Walter B. (Black and Decker Mfg. Co., Towson 4, Maryland): market research and inventory control.

Bryson, R.A. (University of Wisconsin): more than 20 studies of meteorological problems.

Campbell, R.D. (George Washington University): historical records project under Chief of Engineers.

Court, Arnold (1046 Mariposa Avenue, Berkeley 7, California): meteorological, micro-meteorological, and climatological studies.

Crain, Clark N. (University of Denver): population concentrations, population moves, and shifts of land use patterns in small urban communities.

Forstall, Richard L. (Rand McNally and Co.): population of places in the United States.

Frisby, E.M. (South Dakota College of Agriculture and Mechanic Arts): meteorological data for South Dakota.

Griffin, James E. (Central Vermont Public Service Corporation, Rutland, Vermont): marketing-pricing study for Traffic Executives Association—Eastern Railroads.

International Urban Research (University of California): demographic information for world urban areas; labor force information for 550 world metropolitan areas.

Kellog, Charles E. (U.S. Department of Agriculture, Soil Conservation Service): processing of soil survey data.

Kniffin, Fred (Louisiana State University): study of farmsteads and other rural establishments.

Lackey, Earl E. (Quartermaster Research and Engineering Center): temperature and rainfall probabilities from limited weather records.

Latham, James P. (Bowling Green State University): the application of electronic scanning and computer devices to the analysis of geographic phenomena.

Laycock, Arleigh H. (University of Alberta): water surplus and deficiency patterns in the Canadian Prairie Provinces.

Mackay, J. Ross (University of British Columbia): freeze-up and break-up of Mackenzie River in relation to past air temperatures; Mackenzie Delta channel characteristics; correlation of tree ring width with summer temperatures in Mackenzie Delta.

Marble, Duane F. (University of Pennsylvania): analysis of household travel patterns.

Maxwell, James C. (University of Missouri, School of Mines and Metallurgy): geomorphic properties of mountain watersheds in southern California.

Mayfield, Robert C. (Southeastern State College, Durant, Oklahoma): central functions of small north Indian central places; factors influencing the range of central goods in north India.

McKnight, Tom (University of Michigan): manufacturing in Arizona.

Mowll, Jack U. (Penn-Jersey Transportation Study): land use, economic, social, political, and traffic and transportation data on Camden-Philadelphia-Trenton Metropolitan Region.

Northern Natural Gas Co. (2223 Dodge Street, Omaha, Nebraska): rapid retrieval of information on available manufacturing facilities.

Pico, Rafael (Government Development Bank for Puerto Rico): rural land classification program of Puerto Rico.

Price, Dalias A. (Eastern Illinois University): meteorological and climatological studies.

Quartermaster Research and Engineering Command, U.S. Army (Natick, Mass.): micro-climatological studies.

Roepke, Howard G. (University of Illinois): changes in distribution of manufacturing in the United States.

Rudd, Robert D. (Oregon State College): supervision of meteorological and climatological studies.

Schwartzberg, Joseph E. (University of Wisconsin): occupational structure and level of economic development in India.

Snow, Ice, and Permafrost Research Establishment (Wilmette, Illinois): studies of composition and movements of snow and ice.

Taylor, Gordon D. (Department of Recreation and Conservation, Victoria, B.C.): studies of recreational habits of the population.

Ullman, Edward L. (Meramec Basin Research Project, St. Louis, Mo.): origin and destination studies; tourism at Missouri State Parks.

Ursula, Sister Mary (Mount Aloysius Junior College, Cresson, Penna.): changing patterns of Catholic population in eastern United States.

Warman, Henry J. (Clark University): African research project.

White, Gilbert F. (University of Chicago): urban utilization of flood plains in the United States.

Wray, James R. (National Outdoor Advertising Bureau, New York, N.Y.): urban area analysis of Peoria, Illinois; marketing analysis of poster advertising.

Young, Robert N. (California Public Outdoor Recreation Plan Commission, Sacramento): series of studies on various forms of outdoor recreation and recreation areas.

Zelinsky, Wilbur (Southern Illinois University): changes in the distribution of manufacturing in the United States, 1939-1954.

Howard G. Roepke, Chairman
Committee on Mass Data
Processing Techniques

1961 ANNUAL MEETING

PROGRAM COMMITTEE

The Program Committee wishes to remind the membership that texts and abstracts of the papers for the East Lansing meetings must be in the hands of the Program Chairman not later than April 15, 1961.

Details as to form and length of papers are given in the Program Committee's announcement on page 20 in the November, 1960 issue of *The Professional Geographer*.

Eugene Cotton Mather, Chairman
Program Committee

EAST LANSING FIELD TRIPS

There will be two main field trips, one cultural and the other physical, at the East Lansing meetings. The cultural geography field trip, under the leadership of Professor Allen K. Philbrick, is scheduled from 9:00 a.m. to 4:00 p.m. on Monday, August 28. The physical geography trip, under the leadership of Professor Dieter Brunnschweiler, is scheduled from 8:00 a.m. to 5:00 p.m. on Friday, September 1. The cost per person for the Monday trip will be approximately $3.50; that for the Friday trip will be approximately $4.00.

The theme for the cultural geography excursion is the origin and spread of an American settlement form, the dispersed city. Findings of an extensive study on the patterns of urban dispersal in Michigan will be used to demonstrate the manner, extent, and problems of urban expansion into the countryside. Major functional areas of the city-region will be visited, and

their interrelationships will be illustrated by field observation.

The major purpose of the physical geography field trip is to acquaint participants with the evolution of the physical landscape in lower Michigan during and after the retreat of the last ice sheet. Geomorphic, climatic, and biotic phenomena will be discussed at selected sites along an excursion route of some 200 miles. Attention will be drawn to unsolved problems concerning the area's physical geography, including the presence of prairie relics in southwestern Michigan and the possibility of a tundra phase in postglacial time.

Allen K. Philbrick, Chairman
Field Trip Committee

TREASURER'S REPORT

Submitted herewith are statements detailing fiscal operations of the Association of American Geographers during the period January 1, 1960 to December 31, 1960, together with an analysis of the comparative year-end financial situation of the organization during the period 1959-1960.

George F. Deasy, Treasurer

RECEIPTS AND DISBURSEMENTS
January 1, 1960 to December 31, 1960

PART I – NORMAL OPERATIONS

A. *Income*			
1. Dues		28,208.85	
2. Income from Regular Publications			
Annals	8,418.83		
Professional Geographer	2,479.24		
		10,898.07	
3. Income from Securities and Bank Interest Credited to Annals Support Fund (⅛ total)		1,076.38	
4. Other Income from Normal Operations			
Annual Meeting	1,002.51		
Other (including Central Office services)	725.04		
		1,727.55	
Total			$41,910.85
B. *Expenditures*			
1. Administration			
Central Office (*Schedule A*)	17,019.31		
Officers	1,035.95		
Regional Divisions	274.50		
Committees	1,051.99		
Miscellaneous	544.26		
		19,926.01	
2. Regular Publications			
Annals	12,619.22		
Professional Geographer	5,394.25		
Handbook-Directory (1961)	618.98		
		18,632.45	
Total			$38,558.46
Excess of income from normal operations over related expenditures			$ 3,352.39

PART II – SPECIAL ACTIVITIES, EXCEPT CUSTODIAL

A. *Income*			
1. Sale of Special Publications			
Nature of Geography	1,264.60		
American Geography	1,303.05		
Handbook-Directory (1956)	14.50		
Careers in Geography	9.00		
		2,591.15	
2. Income from Securities and Bank Interest Credited to:			
Atwood Research Fund (¼ total)	538.17		
General Research Fund (¼ total)	538.18		
		1,076.35	
3. Donations Received			
Nystrom Fellowship Grant	1,200.00		
Rand McNally Grant	1,000.00		
		2,200.00	
Total			$ 5,867.50
B. *Expenditures*			
1. Grants			
Reserve Fund – IGU Travel Grants	2,500.00		
General Research Fund Grants	1,200.00		
Nystrom Fellowship Grant	1,200.00		
Rand McNally Grant	1,000.00		
		5,900.00	
2. Special Publications			
Nature of Geography		15.26	
Total			$ 5,915.26
Excess of expenditures for special activities, except custodial, over related income			($ 47.76)

PART III – CUSTODIAL ACTIVITIES

A. *Income*	
1. Deferred credit: National Science Foundation Grant No. 10309 for an "Evaluation of the Soviet Research and Training Programs in Geography" by C.D. Harris and associates, monies for which are placed in the custody of the Association	$15,500.00
B. *Expenditures*	
1. Transferred to C.D. Harris	$15,247.83
Excess of income from custodial activities over related expenditures	$ 252.17

PART IV – SUMMARY

A. *Income*			
1. Normal Operations	41,910.85		
2. Special Activities, Except Custodial	5,867.50		
3. Custodial Activities	15,500.00		
			$63.278.35
B. *Expenditures*			
1. Normal Operations	38,558.46		
2. Special Activities, Except Custodial	5,915.26		
3. Custodial Activities	15,247.83		
		59,721.55	
C. *Deferred Credit*			
1. Custodial Activities		252.17	
D. *Excess of Income Over Expenditures*			
1. Normal Operations	3,352.39		
2. Special Activities, Except Custodial	(47.76)		
		3,304.63	
			$63,278.35

SCHEDULE A – ANALYSIS OF CENTRAL OFFICE EXPENDITURES

Salaries (Net)	$ 9,525.88
Employment Taxes and Employee Taxes Withheld	2,935.10
Rent	759.00
Equipment Purchases	130.25
Equipment Rental and Service	164.18
Supplies	1,449.80
Postage and Stamped Envelopes	1,453.31
Accounting and Auditing Services	325.00
Utilities	160.94
Workmen's Compensation Insurance	21.82
Fire and Extended Coverage Insurance	10.00
Property Taxes	84.03
	$17,019.31

COMPARATIVE BALANCE SHEET

(*Excluding Custodial Activities*)

December 31, 1959 and 1960

ASSETS *(1)*	1959	1960
Cash (Checking Account)	$ 4,153.52	$ 7,245.24
Cash (Savings Account)	100.00	300.16
Cash (Petty Cash Fund) *(2)*	75.00	50.00
Accounts Receivable from Broker *(3)*	0.00	392.30
Securities (*Schedule B*) *(4)*	37,310.69	36.918.39
	$41,639.21	$44,906.09

NET WORTH	1959	1960
Annals Support Fund Account	$11,310.25	$12,386.63
Atwood Research Fund Account	6,110.08	6,648.25
General Research Fund Account	6,349.37	5,687.55
Non-Serial Publ. Fund Account	3,391.15	3,391.15
Reserve Fund Account	14,215.86	16,632.51
	$41,376.71	$44,746.09(5)
DEFERRED CREDIT		
Dues Collected in Advance	262.50	160.00
	$41,639.21	$44,906.09

(1) Additional unrecorded assets not shown above include, as of December 31, 1960:
Office equipment and supplies valued at $1,000.00
Inventories of publications valued at $12,550.00.
(2) Termed Central Office Account prior to 6/12/59.
(3) Final adjusted figure for 1959.
(4) Securities are shown at purchase price. Market value as of December 31, 1960 was $53,801.33.
(5) Net worth at December 31, 1960 market value of securities, and including additional assets tabulated in footnote 1, was valued at $75,179.03.

SCHEDULE B — LIST OF SECURITIES

Stocks (Shares)	*Value* (12/31/60)
100 Arkansas Louisiana Gas	$ 3,575.00
50 Bethlehem Steel	1,981.25
100 Brunswick Corporation	4,987.50
100 Cessna Aircraft	3,525.00
20 DuPont	3,745.00
80 Emerson Electric	4,010.00
40 Federated Department Stores	1,530.00
30 General Electric	2,235.00
10 General Foods	708.75
84 General Motors	3,410.50
100 Hugh Long	1,725.00
137 Lehman Corporation	3,750.38
60 Massachusetts Investors Trust	865.20
102 Monsanto Chemical	4,730.25
200 One William Street Fund	2,790.00
60 Pacific Gas and Electric	4,645.00
100 Potomac Electric Power	3,425.00
Total	$51,638.83
Bonds	
1 New York Central R.R., 4½%, 2013	$ 570.00
1 Northern Pacific R.R., 4½%, 2047	882.50
1 Pennsylvania R.R., 4½%, 1984	710.00
Total	$ 2,162.50
Total, all securities	$53,801.33

REGIONAL DIVISIONS

MIDDLE ATLANTIC DIVISION

The Middle Atlantic Division of the AAG held its annual meeting at the National Academy of Sciences on January 14, 1961, bringing to a close a program-year of varied professional activities. The 19 papers presented were grouped into a morning session focusing on land use, economic geography, and miscellaneous other subjects, and an afternoon session with population as its central theme. Dr. Irene Taeuber, the distinguished scholar and demographer, keynoted the afternoon session with a paper entitled "Population as Human Resource in Asia." Another highlight for the 135 MAD members and friends who attended was the luncheon address, "The Unity of Geography," delivered by Jan O.M. Broek, President of the AAG.

During 1960, the Division held five luncheons, five evening meetings, and a field trip. The luncheons, which were attended by an average of 60 members, were informal affairs providing opportunity for socializing and for disseminating professional news. Evening meetings were devoted to discussions on varied topics, with speakers drawn from both geography and related disciplines. The first two programs included Malcolm Robinson and Franklin Frazier who discussed the changing geographic and social patterns of Africa, and the Bureau of the Census geographers who illustrated the methods of area-breakdown and mapping used in the 1960 Census. These were followed by a panel discussion on applied geography led by Robert Campbell, Gordon Reckord, and Dennis Durden, and by notes on polar research with comments from Paul Siple and Frank Ahnert. The fifth meeting featured Eleanor Hanlon and Melvin Scheidt, who surveyed aspects of the theory and practice of conservation. The field trip centered on the problems of urban renewal in Baltimore, projecting growth patterns in Washington, and land use types and trends in the corridor between the two cities.

Divisional officers for 1960 were John P. Augelli, Chairman, Anne Love, Dorotha Garrison, and Jerome Pickard. The executive committee for 1961 will consist of John L. Taylor, Chairman, Bess Burton, Alvin Munn, Richard Randall, and Chiyeko Hoshide.

The Middle Atlantic Division ended the year with a total membership of 375. Professional enthusiasm as reflected by attendance at meetings appears to be increasing, and a survey of the membership indicated a desire for more field trips, an increase in the number of speakers from related fields for the evening meetings, and more frequent dinner programs.

NEW YORK-NEW JERSEY DIVISION

The annual meeting of the New York-New Jersey Division of the AAG was held in Buffalo at the New York State University, College of Education, on October 21-22, 1960. Between 45 and 60 persons attended the various events.

On Friday evening, October 21, there was a symposium on "New York State at Mid-Century," arranged by John H. Thompson (Syracuse University). In the morning of Saturday, October 22, the Division met in the auditorium of the Buffalo Historical Society to hear reports by United States and Canadian officials on remedial work at Niagara Falls and on the new power stations on both sides of the international boundary. There were two concurrent excursions by bus in the afternoon – one to the Niagara power projects in the United States and Canada, and the other to the falls and Welland Canal. Gilbert F. White (University of Chicago) gave a challenging address on "Crucial Trends in the Geographic Profession" at the banquet in the Hotel Stuyvesant on Saturday evening. Thanks are due to Katheryne T. Whittemore and Robert T. Redden (New York State University, College of Education, Buffalo) for a most profitable and pleasant meeting.

Divisional officers elected at the business meeting are: Chairman, Robert B. McNee, City College of New York, New York, N.Y.; Vice-Chairman, George L. McDermott, New York State University, College of Education, Cortland, N.Y.; Secretary-Treasurer, John E. Brush, Rutgers – The State University, New Brunswick, N.J.

Alexander Melamid (New York University) will be convener for occasional meetings during the academic year in New York City. One such special meeting of AAG members living in or near New York was held the evening of December 2, 1960 at the American Geographical Society. Calvin Heusser of the Society's staff gave an interesting illustrated talk on glacier studies in Southern Chile.

The Committee on Improving Geography Education is being continued under the chairmanship of Phillip Bacon (Teachers College, Columbia University). It will be concerned chiefly with certification requirements for primary school teachers, which requirements are now undergoing revision in the New York State Department of Education.

SOUTHEASTERN DIVISION

At the annual meeting of the Southeastern Division, AAG, the Honors Committee awarded the prize for the best student paper to James C. Hamlett, Department of Geography and Geology, East Tennessee State College, Johnson City, Tennessee. As his prize, the winner chose a student membership in the AAG for the year 1961.

SOUTHWESTERN DIVISION

The Southwestern Division of the AAG will hold its annual meeting as a joint session with the Geography Section of the Southwestern Social Science Association, March 31 - April 1, 1961, at the Statler-Hilton Hotel, Dallas, Texas.

ANNUAL MEETING

of the

ASSOCIATION

OF

AMERICAN GEOGRAPHERS

East Lansing, Michigan
Aug. 28 - Sept. 1, 1961

ANNOUNCEMENTS AND REPORTS

GEOGRAPHY IN DENMARK: INSTRUCTION AND RESEARCH

The 1960 International Geographical Congress focused attention upon accomplishments of Scandinavian professional geographers. Through excursions, symposia, and contributed papers, the abilities and interests of scholars from the several countries were emphasized.

This brief analysis purports to reveal the status of geography in Denmark as exhibited by a small but active group of professional geographers at the Universities of Copenhagen and Aarhus. The report deals with both instructional and research facets of the discipline.

Instruction. Geography has been a university discipline in Denmark continuously since 1883, when it became a lecture subject at the University of Copenhagen. The first Department of Geography was established in Copenhagen in 1901 under Professor Ernest Loffler. The Department experienced especially rapid progress after 1940 under the leadership of Professor Niels Nielsen. Geography is taught both as a liberal arts and as a professional subject. Normally, there are about 100 to 125 undergraduate and 5 to 10 graduate students. The staff of 22 consists of 18 scientific personnel involved in teaching, research, and administration, and four in drafting and secretarial work. The Department moved into spacious new quarters in February, 1960, where office, library, and teaching facilities are provided as well as some room for expansion in the immediate future.

The Department of Geography at Aarhus was established in 1942 under the directorship of Professor Johannes Humlum. The scientific staff presently consists of three geographers, supplemented by a cartographer and two secretaries. Fifteen undergraduate students study geography in combination with history in preparation for secondary school teaching. Since 1949, the Department has been publishing *Kulturgeografi*, a journal for population, settlement, economic, political, and historical geography, with Dr. Humlum as editor.

The only other university level teaching of geography in Denmark is being done by Dr. Aage Aagesen in the School of Economics, Copenhagen. This is a private institution for training economists, with economic geography taught as a cognate subject.

Research. The Department in Copenhagen is the major center of geographic research in Denmark. Research in the Department, both fundamental and applied, has been facilitated by establishment of research laboratories and procurement of financial subsidies for projects. This has tended to channel research in certain directions, but in total has stimulated development of the discipline and the output of published material. Department personnel have taken initiative in instituting fundamental research on important Danish problems. Basic research was begun by geographers on land reclamation in western Jutland. After sufficient material was collected and results were shown to have practical value, government agencies and other sources of funds were approached. This method also was utilized in the coastal and salt marsh land reclamation project in southwestern Jutland, and is currently employed in the study of the serious wind erosion problem of cultivated sandy heath soils in Jutland and eastern Denmark.

The first major research project was established in 1931 under the name Skalling-Laboratoriet. This project was centered on Skalling Peninsula just northwest of the west coast port of Esbjerg. Research was begun independentiy in 1930 by Professor Nielsen, and has been supported by the Carlsberg Fund since 1931. The objective was to obtain basic information concerning marshes and sand dunes of the area. Scientists from various disciplines were brought in to make studies under the overall leadership of geographers. Physio-

graphic, geologic, zoologic, botanical, plant and animal physiology, soils, and economic geographical research has been carried out. Much of this research has been published in 17 volumes, beginning in 1935, under the title *Meddelelser fra Skalling-Laboratoriet*. This series represents a basic fund of information which has proved useful in many ways in solving problems of the region. The Skalling Laboratory with its associated field stations also has served as a valuable training ground for geographers and others now employed elsewhere in important research and teaching capacities. Coordination of the research of scholars from several disciplines by a geographer is a rather unique and, from the profession's viewpoint, desirable development.

Research on the Skalling Peninsula lead to an interest in other coastal areas to the south of Esbjerg. Studies were begun on tidal and coastal salt marshes. Much basic information was necessary if land reclamation was to become a reality along the coast. Financial support of one million kronor (ca. $150,000) was given by the Ministry of Agriculture for a five-year period beginning in August, 1953. Two field stations were set up, one at Skaerbaek for investigation of coastal marshes and the other at Tonder for studies of diked lowlands just north of the German border. Three geographers at each station are carrying out basic research on such topics as soil types and mapping, elevation surveys, land utilization, and shallow water studies. Three reports, under the title of *De Danske Vade og Marskundersogelser*, have been compiled since 1957. These contain detailed map and written analyses of the marsh and coastal areas.

Four publications, containing the results of research by Danish geographers, are issued by Det Kongelige Danske Geografiske Selskab (Royal Danish Geographical Society) and edited by N. Kingo Jacobsen (previously by Niels Nielsen). The first, *Geografisk Tiskrift*, has been published since 1877. In recent decades this annual periodical has been devoted to contributions on Denmark and Greenland by Danish geographers; only occasionally does it contain an article on a foreign area. Material published since 1940 illustrates the emphasis in Denmark on financially supported research. *Kulturgeografiske Skrifter*, issued periodically since 1936, consists of monographs on cultural geographic subjects. Topics covered by the six volumes printed to date include: Pacific Ocean Problems; Shipping in the Danish Wadden Sea; Water Power Use in Southern North Jutland — Past and Present; Denmark's Old Tropical Colonies; Geographical Studies of Railways in Denmark; and Some Agro-Geographical Investigations of Denmark. *Folia Geographica Danica* includes nine volumes, of which Volumes VII and IX are in preparation. These have been published since 1950 and consist largely of physical geographical monographs that are written in either German or English. Topics covered thus far are: Subglacial Volcanic Activity in Ancient and Recent Times; The Wadden Sea Near Skallingen; Investigations of the Geography and Natural History of the Praesto Fjord, Zealand; The Marine Foreland; Recent Climatic Fluctuations; Hydrologic Studies of Danish Watercourses; Salt Marsh and Wadden Sea Investigations; and Physical Geography of Greenland. The fourth publication of the Royal Danish Geographical Society is *Atlas Over Denmark*. Volume I, by Axel Schou, is entitled The Landscapes. Volume II, by Aage Aagesen, is called The Population, and will be printed this spring.

Other significant Danish geographical publications are *Meddelelser fra Skalling-Laboratoriet* and *De Danske Vade og Marskundersogelser*, both of which are described earlier; and the 5th edition of J. P. Trap's *Denmark*, which was published by G. E. Gads Forlag, Kobenhavn, 1958. This latter is a basic work, with an introductory volume on the land and people of Denmark and detailed volumes on each county of the country.

The research and publication records speak well for the abilities of Danish geographers. The example of successfully combining fundamental and applied research in the solution of major problems of Denmark could be followed to advantage by geographers in other parts of the world. It is good evidence that geographic research does not have to be relegated to mere inventory, thus leaving to some other discipline the solution of practical problems.

Lawrence M. Sommers
Michigan State University

PHYSICAL GEOGRAPHY IN POLAND

During June and early July, 1960, the writer spent 30 days in Poland at the invitation of the Institute of Geography, Polish Academy of Sciences. The purpose of his visit was to give a series of lectures on various aspects of geomorphology at geographical, geological, and soil-science centers. The trip was made possible by a grant from the National Science Foundation. Each of the Polish universities, located in Warsaw, Krakow, Wroclaw, Lodz, Lublin, Poznan, and Torun, was visited, as well as the Institute of Soil Science at Pulawy (Fig. 1). In addition, several special excursions were arranged for the purpose of seeing in the field various phases of current research in geography, geology, and soil-science. These included trips to the Tatra (Western Carpathians) and Sudeten Mountains, and inspection of numerous important Pleistocene localities. Total travel, which amounted to roughly 5,000 kilometers, was mostly by automobile (see Fig. 1, which shows the routes travelled).

Everywhere in Poland the writer was cordially received. There appeared to be great interest in the lectures, and each was followed by long and vigorous discussion. The Poles are excellent linguists; many scientists speak several languages, including English. They are generally aware of current work in the United States but, because of the dollar shortage, their library holdings of American journals and books are quite restricted.

The author's general impression is that Polish geography, at least in fields he knows best, is carrying on in the tradition of excellence for which it has long been noted. Although there is some direction from the State, research is hampered far more by lack of equipment, libraries, and other facilities, destroyed during the war, than by restrictions on individual freedom. Important fundamental work is being done, and a well trained corps of younger scientists is developing. So far as the writer's field of geomorphology is concerned, accomplishments in Poland during the last decade are as impressive as those in any other European country.

The Institute of Geography, with headquarters in Warsaw, is responsible for planning and directing all geographic research in Poland. These functions are conducted through several individual sections within departments of Physical Geography and Economic Geography. Most universities have a branch office of the Institute as well as a Department of Geography, but commonly the same professor is head of both.

At most universities, the Department of Physical Geography includes sections of geomorphology, climatology, and hydrography. Each section is directed by a professor, and in most cases there is a sizeable number of undergraduate and graduate students. Admission to a university is based on examinations; once admitted, the student who maintains satisfactory scholastic standards is assured of a government stipend which covers all expenses. In general, the curriculum for undergraduates is closely specified, but, as elsewhere in Europe, graduate students do less formal course work and more independent study than their counterparts in the United States.

Geomorphology is a very active subject in Poland at present. Much current work is directed toward study of the Polish Pleistocene sequence. Stratigraphy of the tills, loesses, and other Pleistocene deposits is worked out in amazing detail, and in many areas is thoroughly documented with paleobotanical evidence. Until late in 1960 there was not a radiocarbon laboratory in Poland, and only a few samples have been dated abroad. In recent years, the Poles have been on a periglacial binge. Not only are they concerned with ancient glacial and frost features in their own country, but also they have organized several expeditions to Spitsbergen and other Arctic regions for the purpose of studying the mechanics and dynamics of frost processes. Otherwise, research on quantitative aspects of geomorphology are much less in evidence in Poland than in the United States. An interesting development in applied geomorphology is a field called urban physiography, which is concerned with investigations of the natural and man-made environment from the viewpoint of suitability for the development

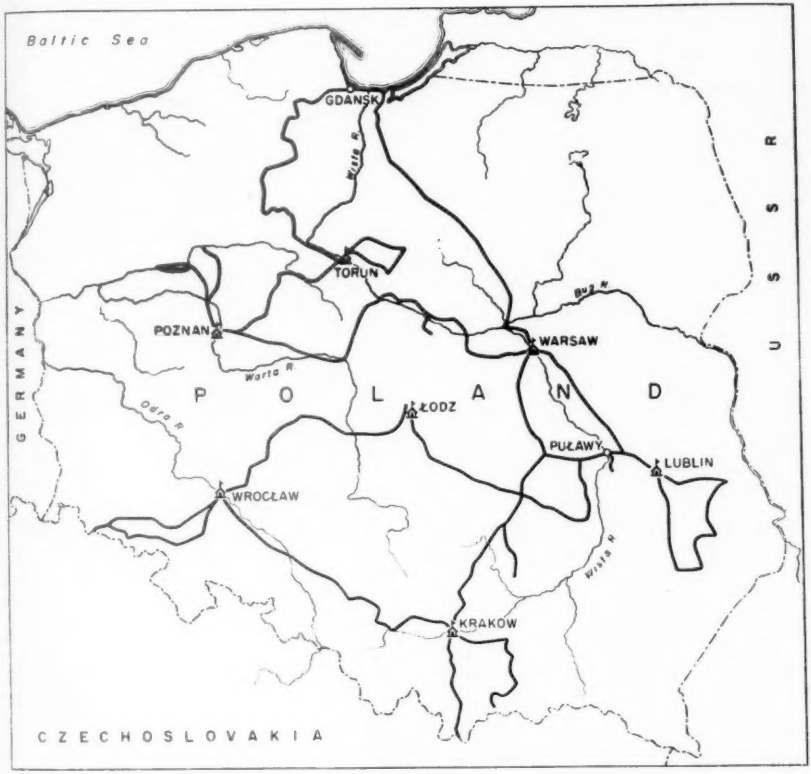

FIG. 1

of towns and settlements. A special State enterprise, called Geoprojekt, was established in 1950 to study topography, climate, hydrology, geology, soil, and vegetation as essential elements of the natural environment affecting locations of man-made structures. It is highly organized and, to all appearances, a very successful arrangement.

A major project of the geomorphologists in the post-war period has been compilation of a detailed geomorphological map, prepared on a scale of 1:25,000, and now being published on a scale of 1:50,000. Completion of this project will require several years. Presently available sheets of this series, which show by means of ingenious symbols the age relations and physical attributes of landscape features, are widely used for planning purposes.

University research in hydrography suffers from lack of equipment and inadequate transportation for obtaining satisfactory hydrologic and hydraulic data. In the post-war years, much effort has been devoted to preparation and publication of hydrographic maps on a scale of 1:25,000. This work is continuing, and will take several more years to complete. Another subject of much study is limnology. There are more than 9,000 lakes in Poland, and several institutions are studying the physical features of the lakes and the nature of their waters and sediments.

Work in climatology is hampered by lack of observation stations and essential mod-

ern equipment. Loss of records during the war was especially serious for this field. However, research is progressing in several phases of meteorology and certain aspects of microclimatology, especially as related to agricultural and settlement problems.

Considerable writing and publication is being done by Polish geographers at present. Among the numerous journals, *Przeglad Geograficzny (Polish Geographical Review)* which is published by the Institute of Geography is most important. There are a few other national journals, and several local ones; also, some of the universities have their own series of geographical publications. At present, the Geographical Institute alone publishes close to 3,000 pages a year.

The Geographical Institute has an annual budget of nearly 6,000,000 zlotys (about $240,000). The Institute library, in Warsaw, includes nearly 50,000 books and periodicals, with good coverage of both physical and economic subjects. The research of all the sections is coordinated by the Director of the Institute. Each staff member above the rank of assistant has unlimited freedom to conduct research in his own systematic field. There is, however, considerable control in connection with publication. For example, all detailed maps are greatly generalized prior to publication. As might be expected, there is much greater difficulty in publishing manuscripts on certain aspects of economic geography than those in the field of physical geography.

The dual organization of Polish geography under both the Polish Academy of Sciences and university departments doubtless has certain advantages in arranging budgetary affairs and research programs. However, to the outsider viewing Polish science in general, it appears that "organization," with the many required meetings and conferences, is a national disease of serious proportions.

A difficulty that affects many kinds of geographic investigations is the fact that military restrictions prohibit use of aerial photographs for research purposes. This case of misguided security greatly restricts the effectiveness of Polish geographers.

The chair system of organization in university departments is one which American professors may view with some jealousy. Balancing the serious shortage of equipment, there is an abundance of personal help for all kinds of matters, ranging from curatorial to direct assistance in research. However, it does appear that the chair system has the disadvantage of requiring entirely too much time for completion of advanced degrees and a generally deleterious effect because young geographers are under excessive direction at the time of their potentially most productive and creative period.

One can see in Poland a widening gap between physical and economic geography. Such a split occurred in the United States more than a generation ago, when various fields of physical geography broke away and became new disciplines or were absorbed into existing disciplines. It seems safe to predict a similar trend in Poland, and the reason is a lack of common ground between economic geographers, who are mostly economists, and physical geographers, who are basically geologists and meteorologists. In the field of geomorphology, both geologists and geographers are now doing similar work in Poland, and many of the geographical geomorphologists feel that stronger emphasis on certain geological aspects of the subject is desirable.

All in all, progress in Polish physical geography since the war has been phenomenal. It is difficult for Americans, accustomed to plenty and insulated from the ravages of war, to imagine the difficulties which still exist. Not only is there a shortage of important research equipment, but also of such simple things as colored pencils, erasers, and projection equipment. Worst of all is the fact that libraries, records, data of various kinds, manuscripts, and personal papers were destroyed during the war.

The writer is especially grateful to Dr. Antoni Kuklinski, Scientific Secretary of the Geographical Institute, Polish Academy of Sciences, for arranging his visit and for reading the manuscript of this article. Discussions in Poland with Mr. Jack Fisher, geographer from Syracuse University, and examination of Mr. Fisher's reports to the Ford Foundation, have contributed materially to an understanding of Polish geographical problems.

John P. Miller
Harvard University

REPORT ON TRANSHUMANCE: A SELECTED INTERNATIONAL BIBLIOGRAPHY

The writer has been interested for some time in the study of phenomena related to the seasonal migrations of herds and flocks in various parts of the world. Over the years, he has had occasion to refer to a considerable number of publications dealing with transhumance. It is believed that a selected listing of such references, international in scope, may be of use to others concerned with the subject. Such a list is presented below.

The three types of shifting animal husbandry – nomadism, transhumance, and alpine pasture economy (Alpwirtschaft) – have been defined and differentiated through the efforts of such scholars as Frodin (1940), Troll (1944), Boesch (1951), Otremba (1951), and Beuermann (1959). *(1)* The specific meaning of the term transhumance, however, has been a matter of controversy for decades, the best definitions being those given by Bernard and Lacroix (1906), Fribourg (1910), Merner (1937), Veyret (1951), and Otremba (1951) *(2)*, to which the present writer added his own definition in 1958. *(3)* Today, there seems to be rather general agreement that transhumance is characterized by the following: (a) a distinctive kind of seminomadism associated with the seasonal migration or transport of herds and flocks between two or more grazing areas of strictly seasonal use, and according to each area's particular location in terms of altitude, climatic conditions, and vegetation; (b) the absence of stable feeding except when it may be seasonally employed owing to economic considerations rather than as a response to unfavorable climatic conditions; and (c) the lack of organic connection between the farmer's headquarters and the ranges, even though such headquarters are usually located close to one of the ranges.

Transhumance has been studied extensively in the countries of Southern Europe, i.e., Spain *(4)*, Italy *(5)*, Southern France *(6)*, and the Balkan Peninsula. *(7)* The same holds true for North Africa *(8)*, parts of South Africa *(9)*, Asia *(10)*, Australia *(11)*, and South America. *(12)* In spite of all these studies, which were mainly done by European authors, there is scarcely any mention in the literature of seasonal migrations of stock in the American West. *(13)* It was the writer's privilege to gather detailed data on transhumance in the Intermontane Region of the United States during his stay at the University of Utah in 1956-1957. The results of this field work were published as the writer's dissertation. There is still lacking, however, a comprehensive study of transhumance as it is distributed over the entire world.

SELECTED BIBLIOGRAPHY

(1) Frodin, J., *Zentraleuropas Alpwirtschaft*. Bd. I, Oslo, 1940.

Troll, C., "Die Alpwirtschaft der mitteleuropaischen Gebirge als Forschungsgegenstand der Landwirtschaftsgeographie," *Bers. z. Deutsch. Landesk.*, 1944, pp. 5-13.

Boesch, H., "Nomadismus, Transhumanz und Alpwirtschaft," *Die Alpen*, 1951, pp. 202-207.

Otremba, E., "Grundbegriffe fur die landwirtschaftsgeographische Arbeit in Mitteleuropa," *Geogr. Taschenbuch*, 1951-1952, pp. 374-384.

Beuermann, A., "Formen der Fernweidewirtschaft (Transhumance-Almwirtschaft-Nomadismus)," *Tagungsber. u. wissenschaftl. Abhandl. 32. Deutsch. Geographentag Berlin*, Wiesbaden, 1960, pp. 277-290.

(2) Bernard, A. and Lacroix, N., "L'evolution du nomadisme en Algerie," *Ann. de Geogr.*, 1906, pp. 152-165.

Fribourg, A., "La transhumance en Espagne," *Ann. de Geogr.*, 1910, pp. 231-244.

Merner, P.G., "Das Nomadentum im nordwestlichen Afrika," *Berliner Geographische Arbeiten*, 11, Berlin, 1937.

Veyret, P., "Les zones d'elevage," *Rev. Geogr. Alp.*, 1951, pp. 41-51.

Otremba, E., viz., item 1, above.

(3) Hofmeister, B., *Die Transhumance in den westlichen Vereinigten Staaten von Amerika*, Ph.D. thesis, Free University of Berlin, 1958.

(4) Aitken, R., "Routes of Transhumance on the Spanish Meseta," *Geogr. Journ.*, 1945, pp. 59-69.

Arbos, P., "The Geography of Pastoral Life, Illustrated with European Examples," *Geogr. Rev.*, 1923, pp. 559-575.

Dantin Cereceda, J., "Canadas ganaderas espanoles," *Comptes Rendus Congr. das Ciencias da Populacao*, Porto, 1940.

Fontavella, V.F., "La trashumancia y la evolucion ganadero-lanar en la Provincia de Valencia," *Estud. Geograf.*, 1951, pp. 773-805.

Fribourg, A., viz., item 2, above.

Klein, J., *La Mesta*, 2nd ed., Madrid, 1936. (English edition: *The Mesta: A Study of Spanish Economic History*, Cambridge, 1920.)

Llobet, S. and Vila, V., "La trashumancia en Cataluna," *Comptes Rendus Congr. Intern. Geogr., Lisbon, 1949*, pp. 36-47.

Memoria sobre el estado de la administracion y legislacion de las Canadas y demas asuntos relativos a la trashumacion de los ganados, Madrid, 1847.

Rosa, A. de la, *Memoria sobre la manera de trashumacion*, Madrid, 1861.

Sorre, M., "Nomadisme agricole et transhumance dans la Sierra Nevada," *Ann. de Geogr.*, 1932, pp. 301-305.

Valenti, J.V., "Una encuestra sobre la trashumancia en Cataluna," *Pirineos*, 1950, pp. 405-442.

Violant y Simorra, R., "Notas de etnografia pastoril pirenaica: La trashumacion," *Pirineos*, 1948, pp. 271-286.

(5) Bujatti, P.G., "Transhumance and permanent pastures for sheep in the Apennine Mountains," *Monti e Boschi*, 1953, pp. 24-27. (Ital.)

Dominicis, F.N. de, *Lo stato politico et economico della Dogana della Mena delle pecore in Puglia*, Naples, 1781.

Franciosa, L., "La transumanza nell 'Appennino Centro-meridionale," *Mem. Geogr. Econ.*, Naples, 1951.

Grenier, A., "La transhumance des troupeaux en Italie et son role dans l'histoire romaine," *Mel. d'Archeol. et d'Hist.*, 1905, pp. 293-328.

Ivancic, J., "Uber die Hirtenstrassen in Apulien," *Illyr. Alban. Forsch.*, Munich, 1916, pp. 527-537.

Kish, G., "Transhumance in Southern Italy," *Michig. Acad. Science, Arts, Letters*, 1953, pp. 301-307.

Lamboglia, C., "La transumanza nelli Alpi Ligure," *Atti VIII Congr. Geogr. Ital.*, Pt. 2, 1921, pp. 421-427.

Maoli, O., "Transhumance of sheep in Italy," *Congr. Intern. Allev. Ovino 1949*, pp. 277-284. (Ital.)

Roletto, G., "La transhumanza in Piemont," *Riv. Geogr. Ital.*, 1920, pp. 114-120.

(6) There is such a large number of publications on transhumance in France that only the names of authors are listed: Anchierri, L. (1953-1954); Arbos, P. (1922, 1949); Blade, J.F. (1892, 1894); Cabannes, H. (1899); Cadane, J. (1946); Caput, J. (1950); Cavailles, E.H. (1905, 1932); Chevalier, M. (1906, 1949, 1951); Clarens, L. (1948, 1950); Fabre, L.A. (1908); Fournier, J. (1900); Geze, J.B. (1924); Lefebvre, T. (1928); Leucewicz, S. (1916); Mauron, M. (1951); Moyal, M. (1952); Onde, H. (1932); Sorre, M. (1913).

(7) Dedijer, J., "La transhumance dans les pays dinariques," *Ann. de Geogr.*, 1916, pp. 347-365.

Kral, J., *La transhumance dans les hautes montagnes de la Russie subcarpatique*, Prag, 1926.

Martonne, E. de, "La vie pastorale et la transhumance dans les Karpates meridionales; leurs importance geographique et historique," *Festschr. z. Friedr. Ratzels Gedachtnis*, Leipzig, 1904, pp. 225-245.

Opreanu, S., "Contributiuni la transumanza din Carpatii orientali," *Trav. Inst. Geogr. Univ. Clui*, Klausenburg, 1928.

Somesan, L., "La transhumance des bergers transilvains dans les provinces romaines," *Rev. Transilv.*, 1935, pp. 465-476.

(8) Bernard, A. and Lacroix, N., viz., item 2, above.

Biolley, H., "La transhumance du mouton: une des causes principales de la deforestation et de l'alteration du regime des eaux specialement en Af-

rique," *Actes 1er Congr. Intern. Sylvic.*, Rome, 1926.

Capot-Rey, R., "Le nomadisme pastoral dans le Sahara francais," *Trav. Inst. Rech. Sahar.*, Algier, 1942, pp. 1-24.

Celerier, J., "La transhumance dans le Moyen Atlas," *Hesperis*, 1927, pp. 53-68.

Clarke, J., "Les problemes du nomadisme estival vers le Nord de la Tunisie," *Bull. Assoc. Geogr. Franc.*, 1952, pp. 134-141.

....., "Summer Nomadism in Tunesia," *Econ. Geogr.*, 1955, pp. 155-167.

....., "Studies of Semi-nomadism in North Africa," *Econ. Geogr.*, 1959, pp. 95-108.

Herault, M., *La transhumance du mouton au Maroc oriental*, Toulouse, 1938.

Merner, P.G., viz., item 2, above.

Niemeier, G., "Vollnomaden und Halbnomaden im Steppenhochland und in der nordlichen Sahara," *Erdkunde*, 1955, pp. 249-263.

(9) Agro-Economic Survey of the Union (III): The Drakensburg Grazing Regions, Union of S. Afr., Dept. Agric., Bull. 289, Pretoria.

Gluckmann, M., *Economy of the Central Barotse Plain*, Rhodes–Livingstone Papers, No. 7, Livingstone, N. Rhod.

Naude, J.S.P., *Economic Investigation into Livestock Farming in the Northern Transvaal*, Pt. 1: The Highveld Plateau, Union of S. Afr., Dept. Agric., Bull. 121, Pretoria.

(10) Gholam Omar, M., *La vie rurale en Afghanistan*, Toulouse, 1947.

Hutteroth, W.D., "Bergnomaden und Yailabauern im mittleren kurdischen Taurus," *Marburger Geogr. Schriften*, Heft 11, Marburg, 1959.

Morosawa, O.I., "Transhumance of Karakul Sheep to Alpine Ranges in Tadshikistan," *Karak. Sverov.*, 1953, pp. 28-33. (Russ.)

(11) Scott, P., "Transhumance in Tasmania," *New Zeal. Geogr.*, 1955, pp. 153-172.

(12) Daus, F.A., "Trashumacion de montana en Neuquen," *An. Soc. Arg. Estud. Geogr.*, 1948, pp. 383-426.

Deffontaines, P., "Mountain Settlement in the Central Brazilian Plateau," *Geogr. Rev.*, 1937, pp. 394-413.

Wilhelmy, H., "Die Weidewirtschaft im heissen Tiefland Nordkolumbiens," *Geographische Rundschau*, 1954, pp. 41-54.

(13) Research on transhumance in western United States has been done almost entirely by non-geographers, and such studies are rare. Two of the more detailed and comprehensive are the following:

Hochmuth, H.R., *Sheep Migration in the Intermountain Region*, U.S. Dept. Agric., Circ. 624, Washington, D.C., 1942.

Roth, A.H., *A Graphic Summary of Grazing on the Public Lands of the Intermountain Region*, Pt. 11: Seasonal Use Relationships of Lands Used in the Production of Range Livestock, Intermountain For. and Range Exp. Stat., Ogden, 1941 (mimeogr.).

Burkhard Hofmeister
Freie Universitat Berlin

GEOGRAPHY'S ROLE IN THE 1960 NSF SUMMER INSTITUTE IN EARTH SCIENCE AT MICHIGAN TECH

The 1960 NSF Summer Institute in Earth Sciences held at The Michigan College of Mining and Technology was, as far as the writer knows, either the only one or one of the very few in which geography played a major role in the program. For this reason, it is believed that the experiences of the Michigan Tech participants may be of interest to others who may wish to submit proposals to the NSF for future Institutes.

"The unanimous opinion [of the participants] was that the inclusion of geography represented a significant contribution to the success of the program." This quotation is from the Director's report to the National Science Foundation, made at the conclu-

sion of the Institute. The quotation should be of interest to geographers across the land who are concerned with the image of the discipline held by non-geographers.

Last fall Dr. Donald G. Yerg and Dr. D.O. Wyble, both members of the Department of Physics at Michigan Tech, invited the writer to collaborate in the planning and operation of an Institute in Earth Science designed especially for high school teachers of physics. Following several meetings, it was agreed that geography should play a part in the program; two roles, specifically, were defined. First, topics in physical geography would be presented during the early weeks of the program to form a foundation for advanced topics in the physics of the earth. It was felt that geography could be used to bridge the gap between the generalist high school teacher, and the earth scientists responsible for instruction in advanced topics. Second, selected topics in economic and cultural geography would be introduced in the latter half of the program to emphasize the link between research efforts in the earth sciences and the solution of growing world problems of survival and economic viability.

The program, approved by the National Science Foundation and conducted under the directorship of Dr. Yerg, attempted to present "a unified treatment of geophysics, atmospheric physics, and geography." The major theme was presentation of the physical state of the earth from the center to the outer reaches of the atmosphere. Secondary objectives were a review of major research findings in the earth sciences, including the program of the IGY; and consideration of the implications of basic and applied earth science research for global economic, social, political, and military problems.

The plan called for three full-time staff members to handle the bulk of the instructional load. Dr. Yerg, a research specialist on the physics of the upper atmosphere, dealt with advanced atmospheric topics; Dr. Wyble, a specialist in geophysics, assumed responsibility for material dealing with the solid earth; and the writer had the challenging task of integrating the geography content into the scheme. Sixteen guest lecturers supplemented the basic interdisciplinary core of the program.

Some details of program content and operation. Forty high school teachers were chosen from 340 applicants. All those selected, except two special applicants, taught at least one course in physics in their school; all had had preparation in college algebra and college physics. Representatives of both large and small high schools were among those chosen. All but one of the participants were male.

The following books were assigned as required reading: Strahler, A.N., *Physical Geography,* 2nd edition, John Wiley and Sons, New York, 1960; Bates, D.R., *The Earth and Its Atmosphere,* Basic Books, Inc., New York, 1957; and Scientific American, *The Planet Earth,* Simon and Schuster, New York, 1957. A large collection of other books and literature was made available through the NSF for study or inspection.

Classroom instruction was held from 8:15 a.m. to 12 noon each morning, Monday through Friday. Friday mornings were usually reserved for special presentations and critiques in which all participants contributed. Occasional afternoon or evening panel discussions and exhibitions were scheduled to synchronize with classroom work. A number of afternoon field trips and demonstrations were also arranged: these included studies of local geology, copper mines, mineral research establishments, and geophysical field methods. The participants were given the option of taking examinations for possible certification of nine quarter-hour credits.

A highly successful feature of the Institute – one unanimously praised by the participants, many of whom had attended other summer institutes in previous years – was the attendance of all regular staff members at class meetings. Under this system, the three instructors were always present to offer comments and ideas when a topic or question in their field was broached. Very often, when a particularly exciting theme generated more than usual enthusiasm, the formal lecture would give way to an informal panel-type exchange among the staff and participants, with everyone taking an active part. It would be difficult to exaggerate the educational benefits of this kind of spontaneous foray into complex questions relating to several disciplines.

Indications of the success of the Institute. At the conclusion of the Institute, the par-

ticipants designed and executed a program evaluation questionnaire, results of which were given to the Director and staff. Based upon the response to this questionnaire, and upon general conversations, the program was an unqualified success. Of particular interest here is the participants' reaction to the inclusion of geography as a major part of the program. One of the 14 questions on the evaluation questionnaire read: "Evaluate the incorporation of geography in this program." The response to this question is summed up in the quotation from the Institute Director's report near the beginning of this paper. Also worth noting is the keen interest which was shown by the high school physics teachers in such geographic problems as environmental pollution and the staggering acceleration in consumption of natural resources.

Joseph H. Butler
The Michigan College of
Mining and Technology

DEPARTMENTAL STATUS OF GEOGRAPHY

The following tabulation comprises a compilation of statistics derived from J.R. Schwendeman's *Directory of College Geography of the United States: Academic Year 1959-1960*. The tabulation deals with the departmental status of geography in 631 American colleges and universities. The compiler offers it with the thought that it may be of interest to other members of the geographic profession.

Status Category	Number of Cases		Percentage of Total Sample	
Geography as a Separate Department		149		23.6
Social Sciences and Geography				
Geography included within Social Studies or Social Science Department or Division	223		35.3	
Geography included within Economics or Business Administration Division	51		8.1	
Geography included within History Department	17		2.7	
Geography included within History-Government Department	9		1.4	
Geography included within Sociology or Sociology-Anthropology Department	10		1.6	
Subtotal		310		49.1
Physical Sciences and Geography				
Geography included within Science or Physical Science Department or Division	28		4.4	
Geography included within Geography-Geology Department	89		14.1	
Geography included within Geology Department	17		2.7	
Geography included within Earth Science Department or Division	14		2.2	
Geography included within Biology Department	3		.5	
Geography included within Natural Resources	1		.2	
Geography included within Air Science	1		.2	
Geography included within Engineering	1		.2	
Subtotal		154		24.4
Miscellaneous				
Geography included within Education Department or Division	14		2.2	
Geography under Dean of Instruction	3		.5	
Geography in an Area Department	1		.2	
Subtotal		18		2.8
Total		631		100.0

Robert M. Newcomb
Los Angeles State College

NEWS FROM GEOGRAPHIC CENTERS

HARPUR COLLEGE

The Geography Department at Harpur, the Liberal Arts College of the State University of New York, is now in new quarters and is proud of its new cartography laboratory and meteorology station. The College recently moved from Endicott to its $22 million campus near Binghamton. Preston E. James (Syracuse University) was the official AAG representative at the campus dedication ceremonies in September.

Joseph E. Van Riper is Chairman of the Department. He is currently on a two-year leave of absence at the American University of Beirut, Lebanon. Keith M. Clayton (London School of Economics) is visiting Professor for the period 1960-62. His interests center on geomorphology and soils, and he is the editor of *Geomorphological Abstracts*. Richard E. Lonsdale, a recent Ph.D. from Syracuse, has joined the staff as Assistant Professor. He is teaching courses on the USSR, economic and cultural geography, and geographic thought.

ILLINOIS, UNIVERSITY OF, CHICAGO

The staff of the Chicago Division of the University of Illinois remains active in teaching and other professional activities.

Mary Colby was awarded a University Summer Fellowship and spent the past summer in Europe studying the ports of Genoa, Italy; Duisburg and Emden, West Germany; and Narvik, Norway. She continues to serve the Chicago Geographical Society, currently as Third Vice-President. Both Mary Colby and Alden Cutshall attended the Stockholm meetings of the International Geographical Congress in August.

Alden Cutshall spent more than two months in western Europe, some of the time on Congress excursions and symposia and part of the time in personal travel and observation. He has just completed a major assignment for *Collier's Encyclopedia* on various Philippine subjects. The major article, prepared more than 10 years ago, has been completely recast and rewritten; some 25 lesser articles have been edited, up-dated, or rewritten; and several new articles were prepared. Other recent work includes articles for the 1960 edition of *Encyclopedia Americana*, for *Encyclopaedia Britannica*, and for *American People's Encyclopedia*. "Tobacco Production in the Philippines" appeared in *Transactions of the Illinois State Academy of Science*, Vol. 52, 1959, pp. 33-44; and "The Philippine Sugar Industry: Status and Problems" was published in *The Journal of Geography*, Vol. 60, 1961, pp. 5-9. In 1960, Cutshall was appointed AAG delegate to the AAAS and to the AAAS Council; and he is a member of the Local Arrangements Committee for the Association of Asian Studies Chicago Meeting, March 27-29, 1961.

Mildred Finney has been appointed by the State Superintendent of Public Instruction to membership on a committee charged with preparation of a guide for high school geography work in Illinois. Recently she prepared a series of articles on Illinois cities for *Chamber's Encyclopedia*. She taught the summer work at Illinois in 1960, and will offer summer session classes again in 1961.

George A. Rheumer taught the summer of 1960 at Victoria College, British Columbia, and will spend the 1961 summer at the University of British Columbia.

LOS ANGELES GEOGRAPHICAL SOCIETY

Programs. "Report from Stockholm: A Panel Discussion on the XIXth International Geographical Congress" by four Society member delegates, Harry Bailey (UCLA), Glenn Cunningham (Los Angeles City College), Richard Logan (UCLA), and Midori Nishi (Los Angeles State College) provided the program for the annual banquet meeting of the Society held in December.

Other recent programs in the series of illustrated lectures included "Pasture and Plough in New Zealand" by Gordon Lewthwaite, Assistant Professor of Geography (San Fernando Valley State College); "The U.S.S.R., A Geographic Appraisal" by Louis Kostanick, Associate Professor of Geography

(UCLA); and "The Pennsylvania Dutch Country" by Jack Reith, Associate Professor of Geography (University of Southern California).

Publications. Geographical Journeys, the first publication of the Los Angeles Geographical Society, is in preparation. *Journeys* is to be a geographical description of trips in the Los Angeles area written by professional geographers, using language designed to appeal to the layman. Under the editorship of Glenn Cunningham (Los Angeles City College), 14 geographers representing nine Southern California institutions are contributing chapters.

Tours. Two Society-sponsored tours are planned for the year 1961. A nine-day tour of Hawaii during Easter vacation will leave Los Angeles March 24, returning April 2, and will include Hawaii and Maui as well as Oahu.

The fifth annual Mexico tour will leave Los Angeles August 19 and return September 3. The air flight to Mexico City will be followed by a 15-day geographical cross-section of Mexico by chartered bus.

New Officers. The following new officers have been elected for 1961: President, Glenn Cunningham (Los Angeles City College); Vice-President, Benjamin Thomas (UCLA); Recording Secretary, Frances Sylvester (Alta Loma School); Corresponding Secretary, Linda Johnson (Student, San Fernando Valley State College); Treasurer, Don Philipp (L.A. County Regional Planning Commission); Councilors, Arthur Carthew (Los Angeles City College), James Gladson (Eagle Rock High School), William Pattison (UCLA), Robert Pease (Walter Reed Junior High School), and Rod Steiner (Long Beach State College).

MASSACHUSETTS, UNIVERSITY OF

Shannon McCune, Provost of the University, has been appointed Director of the Department of Education in the Secretariat of UNESCO (United Nations Educational, Scientific, and Cultural Organization) and entered upon his new duties in January, 1961. Greatly expanded UNESCO educational activities in tropical Africa as well as programs in Latin America, the Middle East, and other areas will be under his administration. Dr. McCune has been a member of the United States National Commission for UNESCO for the last three years, serving on the Education Committee and on a panel dealing with UNESCO's Third Major Project: The Mutual Appreciation of Eastern and Western Cultural Values. Having been born in Korea and having carried on research and teaching in Asia and America for many years, he has been especially interested in these aspects of UNESCO's programs.

MICHIGAN STATE UNIVERSITY

The Geography Department at MSU has now been an independent unit for five years. It has witnessed a steady increase in the number of both graduate and undergraduate students. Total enrollment of almost 1,000 in the fall of 1960 surpassed that of last year by 40 per cent. There are 22 graduate students in residence, half of whom are doctoral candidates. The first Ph.D. degree given by the Department was conferred upon a Japanese student at the end of the Summer Term, 1960.

The staff has remained unchanged during the last two years. Lawrence M. Sommers, Head of the Department, has just returned from a sabbatical leave which he spent doing field work in Europe. During his absence, Clarence L. Vinge was Acting Chairman. Paul C. Morrison continues his research on land use in tropical Latin America and Japan. Allen K. Philbrick finished a three-year project on the impact of highways on land use in Michigan. It was supported by government and university grants exceeding $20,000. During last summer he conducted a workshop on the teaching of geography in primary and secondary schools. His text on world regional geography will be published in 1961. Edward C. Prophet celebrated the rare jubilee of having broadcast "Geography in the News" twice weekly for 25 years over MSU radio. At the fall meeting of the East Lakes Division of the AAG, he talked as an invited speaker on recreational land use in Michigan. Charles W. Boas reported both to the Michigan Academy and to the spring meeting of the East Lakes Division of the AAG at Flint on his studies of the automobile industry. He was Visiting Professor at the summer school of the University of British Columbia. Dieter Brunn-

schweiler is engaged in research on periglacial conditions in North America and on problems of physical geography in Michigan. He contributed the chapter on the physical background in the forthcoming new edition of Hoffman's *Geography of Europe*. Last summer he lead a group of 27 students on a European study tour before participating in the IGU meeting. For this occasion four members of the MSU staff prepared papers (Sommers, Brunnschweiler, Philbrick, and George A. Borgstrom, professor of food science at MSU). Morrison also attended the meeting.

The field camp held at Michigan State's Kellogg Gull Lake Biological Station during the summer of 1960 was under the direction of John F. Lounsbury (Antioch College). Also visiting was Lorin A. Kennamer (University of Texas) for the on-campus summer session. Other visitors to the Department during 1960 included Kenneth McMurray (University of Michigan), William R. Mead (University College, London), and Hans Carol (University of Zurich).

One of the most recent endeavors of the Department is the establishment of a University Map Library. The Department's air photo collection now contains some 100,000 prints. Due to the effort of Robert A. Miller, Instructor, a local chapter of Gamma Theta Upsilon was granted to the Department. The staff is presently busy preparing for the 1961 AAG Meetings in East Lansing, August 28-September 1.

ORANGE COUNTY STATE COLLEGE

Geography is making a good start at the newly opened Orange County State College in Fullerton, Calif. Delmas Bugelli is Chairman of the Department. He is assisted by Arthur Earick, formerly of Oklahoma State University. Seven regional and systematic geography courses were offered in the initial semester, and a major program may be initiated in geography next year. Orange County State College is the seventh four-year college in the Los Angeles area to establish a full-fledged Department of Geography.

WESTERN MICHIGAN UNIVERSITY

Recent developments in the Department of Geography and Geology at Western Michigan University may be of interest to professional colleagues. With the untimely death of Professor William J. Berry in 1958 and the retirement of Associate Professor Marguerite Logan in 1959, the Department lost the services of its two senior members. William R. Brueckheimer, a member of the staff since 1955, was appointed Head of the Department in 1958. With the addition of at least one man every year since 1955, the staff has increased from three to ten.

In the past two years, there has been considerable reorganization and expansion of the curriculum because of the larger staff. Brueckheimer maintains his interest in economic and political geography; in collaboration with the local ROTC, he recently introduced a course in Geographic Foundations of National Power. Cyril Stout, senior member of the staff, has specialized for years in North American studies and geographic education; he recently contributed an article to the *Bulletin on Geography for High Schools in Michigan*. Oscar Horst offers courses on Middle and South America. Eugene Kirchherr has introduced courses in urban geography and Africa and will teach cartography. Stanley Moore specializes in Asian studies. Lloyd Schmaltz, a geologist who joined the staff in 1959, has assumed responsibility for the geology program. George Nasse teaches European and Soviet geography, and Henry A. Raup will offer conservation and field techniques. Instructors Donald Josif, Robert Vogel, and Arthur Wilner are concentrating their research efforts on completion of doctoral studies. Col. Albert Jackman, commanding officer of the ROTC unit, is also a professional geographer and participates in departmental activities.

The addition of new geography courses has resulted in greater student interest, as evidenced by the increase in majors from 12 to 50 in the period 1958-1960; another 200 students are minors. Of particular significance is the large number of students (1,000) in the freshman course in physical geography. At the present time, a Master's program in geography is being developed. In 1962, the Department will move into the new Science Building now under construction.

Members of the staff have been active in research projects and other professional ac-

tivities. Brueckheimer, Schmaltz, and Kirchherr taught Earth Science in NSF institutes for science teachers; Horst and Kirchherr assisted in the 1959 summer institute on geobotany; and Schmaltz was a participant in the 1959 summer institute on marine geology and oceanography. Horst was recipient of a grant for field research in the Dominican Republic for the 1960-1961 school year. For the summer of 1960, Moore was awarded a special grant by the Institute of Regional Studies of WMU to assist in preparation of an interdisciplinary course on The Non-Western World. Kirchherr has participated in a special program of Faculty Seminars on Africa, and was recently awarded a grant for field research in West Africa. Nasse will continue field studies in Europe during the summer of 1962. Raup was co-author of the *Campground Atlas of the United States and Canada.* The retired Lucia Harrison recently published a book, *Sun, Earth, Time and Man.* Brueckheimer was appointed a member of the State Committee on Conservation Education. Members of the staff have also presented papers at meetings of the Michigan Academy, the AAG, and at local professional and teachers' meetings.

Through strengthening of the geography and geology program and the professional activities of the staff, it is hoped that the Department will continue to develop as a center of geographic training and research.

OTHER ITEMS

INQUA MEETING, AUGUST-SEPTEMBER, 1961

The International Association for Quaternary Research (INQUA) will meet in Poland during the late summer of 1961. The Congress, which meets every four years, will be preceded by an excursion starting from Warsaw on August 27. The first meeting of the Congress will take place on September 2 and the last meeting on September 7. A post-Congress excursion will be held from September 7 to 21 and will visit the main localities containing Polish Quaternary deposits.

INQUA was first organized during an international geological meeting in Copenhagen in 1928 for the purpose of approaching Quaternary problems on an interdisciplinary level, particularly in the fields of geology, archaeology, climatology, and chronology. Although the Congress has been attended primarily by Europeans, it is international in character and non-Europeans are urged to attend.

It has been the desire of many Europeans and Americans to hold the Congress in the United States at some future time. To this end, the National Academy of Sciences-National Research Council created a United States Committee on INQUA. This Committee is making plans to invite the next Congress to meet in this country during the late summer of 1965.

All persons interested in the 1961 Congress in Poland may obtain more detailed information by writing to the following: Professor Rajmund Galon, Secretary General, INQUA, Geographical Institute, University, Torun, Poland.

ASSOCIATION OF ASIAN STUDIES

The thirteenth meeting of the Association of Asian Studies will be held at the Palmer House in Chicago, March 27-29, 1961. The program of some 30 sections will cover a variety of subjects in the social and humanities fields. Of special interest to geographers is a panel session entitled "Agricultural Expansion in Asia," arranged by Rhoads Murphey, which will be held on the afternoon of March 28 and chaired by Peter Gosling. It includes three papers: "Expansion of Irrigation in West Pakistan," David Firman, State Teachers College, Towson, Maryland; "Recent Developments in the Double Cropping of Rice in Japan," George Kakiuchi, University of Washington; and "Philippine Agriculture in Transition," Alden Cutshall, University of Illinois (Chicago). John D. Eyre is listed as a discussant.

IGC PUBLICATIONS AVAILABLE

The *Geography of Norden* which was distributed to those registering at the XIX International Geographical Congress, can be purchased from J.W. Cappelen Publishers, Oslo, Norway, for 53 Norwegian kroner. A few copies of the volume of

Abstracts of Papers on the program of the Congress are available from the Congress Secretariat, address Postfack, Stockholm 6, Sweden, at 15 Swedish kroner. Payment may be made in any currency.

1960 FOREIGN FIELD RESEARCH PROGRAM AWARDS

On December 12, 1960 a Screening Committee consisting of Drs. Edward A. Ackerman, Robert Platt, Richard Russell, and Edward B. Espenshade, Jr., ex officio, met at the National Academy of Sciences to consider applications for the sixth competition under the Foreign Field Research Program. Thirty-one applications were reviewed, representing 20 schools and 10 regions of interest. The Committee recommended the following eight proposals for support and all recipients of awards have accepted.

Denevan, William M., University of California, Berkeley, *The Llanos de Mojos, Northeastern Bolivia: A Seasonally Inundated Tropical Lowland* (14 months in field).

Dichter, David, London University, *The Regional Geography of Pakistan's Northwest Frontier* (4 months in field).

Field, Chris, University of California, Los Angeles, *Distribution and Classification of Agricultural Terraces in the South Central Andes* (9 months in field).

Gauthier, Howard L., Jr., Northwestern University, *The Regional Pattern of Transportation and Urban Development in Sao Paulo, Brazil* (12 months in field).

Hill, A. David, University of Chicago, *Road Development and Land Use Change in Villa Las Rosas, Chiapas* (9 months in field).

Wilhelm, Eugene, Jr., Louisiana State University, *The General Forest Ecology of the Lake Country of South Chile and Argentina* (13 months in field).

Woolever, Charles W., Syracuse University, *The Effects of Political Partition of the Manufacturing Development of the Old Indian Province of Bengal* (12 months in field).

Wolpert, Julian, University of Wisconsin, *Areal Variations in Farm Income in Middle Sweden* (15 months in field).

This brings to 53 the number of projects supported under the program. Nine reports have been published, two will be published shortly, and three are being edited for publication.

This program, which is supported by the Geography Branch of the Office of Naval Research and administered by the Earth Sciences Division of the National Academy of Sciences, provides opportunities for young American scientists to undertake studies abroad on subjects of their own choosing.

General Herman Beukema, member of the AAG and Director of the Army Specialized Training Program during World War II, died November 26, 1960, at the age of 69.

Lester E. Klimm, President of the AAG, 1958; member of the Council of the American Geographical Society; and long professor at the University of Pennsylvania; died December 16, 1960, at the age of 58. He was senior author of Introductory Economic Geography.

COMMUNICATIONS FROM READERS

TRAVEL CONDITIONS IN POLAND

Dear Editor:

Having travelled extensively in Poland during the past summer, I would like to comment briefly on existing living conditions there for the benefit of geographers planning to attend the INQUA (International Association on Quaternary Research) meetings during August and September, 1961.

Anyone making his first visit to Poland should expect to find conditions different in many respects from those prevailing in the United States. Almost everything is State owned and operated, with the result that service in restaurants, hotels, stores, etc. is slow and indifferent. Poland has some excellent highways but, as most Poles cannot afford cars, facilities for motoring are scarce and undependable. Except for less variety, Polish food is generally similar to ours and the daily schedule of meals is only slightly different. Hotel accommodations are satisfactory only in the larger cities. Polish plumbing is a disgrace, and drinking water is unsafe in many places. If the several hundred scientists now registered actually attend the INQUA meetings, facilities for accommodations will be greatly strained.

On the other side of the coin, Americans may be assured of an exceedingly warm and friendly welcome from the Poles — not just the scientists, but all Poles encountered. They are intensely interested in America, and are full of questions about it. Likewise, they are most knowledgeable on all matters of their national history and delight in showing visitors the ancient buildings and monuments of their area. Although there are some slight restrictions on one's movement in Poland, and such annoyances as registration with the police in every town, the genuine friendly nature and hospitality of the Poles will offset any such inconveniences, and will make a visit to Poland during the INQUA meetings a truly memorable occasion.

John P. Miller
Harvard University

GROWING INTEREST IN GEOGRAPHY

Dear Editor:

At the recent annual meeting of the Middle Atlantic Division in Washington, D.C., AAG President Jan Broek appealed to geographers to take more active interest in the status of geography at the high school level. In this connection, I felt that the following item might be of interest to readers of *The Professional Geographer*.

The Board of Education in Montgomery County, Md., is working on a revision of the curriculum from kindergarten through high school. Among other things, the Board appointed an advisory Curriculum Study Committee from among interested citizens, and invited me to join a subcommittee on social studies as a representative of geography. I gladly complied.

The Board also considered that in many social science classes some geography is needed. For instance, the proposed elective on the Far East will include geography, history, and some sociology and economics of the region. However, such a course must be taught by teachers who have had no geographic training. The County, therefore, is starting in-service training classes for such teachers, and I was asked to teach the first such course beginning in February.

Possibly geographers in other areas have had similar encouraging experiences indicating a growing appreciation of the value of geography. If not, they may be encouraged by this note to determine what they can do in their areas.

Eric Fischer
Takoma Park, Md.

GEOGRAPHERS, PLEASE NOTE!

Dear Editor:

After sitting through numerous lectures straining to hear what it is all about, one important fact becomes self-evident, that geographers should take a course in public speaking. Even an elementary one, to learn a few fundamental facts, such as: (a) face the audience bravely; they would not be there unless they wanted to hear what you have to say; (b) do not speak in a low conversational mumble to the *front* row; remember the *back* row for the nicest people often sit there; (c) again, stand facing the audience; let *them* look at the screen and admire or criticize your slides or maps — you should be so familiar with them that one quick glance will suffice to identify them.

Please, please, please always remember the outer fringes of any gathering, whether in a classroom, a lecture hall, a guided tour, or during an introduction to a speaker. Yours for clearer speech.

Ena L. Yonge
American Geographical Society

VISUAL AIDS: A SHORT *P. G.* BIBLIOGRAPHY

Dear Editor:

The suggestions made by Howard Koverman, Jr. (*The Professional Geographer*, Vol. XIII, No. 1, p. 38) with reference to improving presentation of papers at our national meetings prompt me to set down a short bibliography which will assist speakers and visual aid committees. All of these articles are found in issues of *The Professional Geographer* as indicated: Basile, R.M., "Toward the Development of Better Lantern Slides," November, 1957; Cressey, G.B., "Advice to Speakers," November, 1954; James, P.E., "Remarks on the Presentation of Papers," September, 1959; and Murray, M.A., "Visual Aid Procedures for Our National Meetings," September, 1960.

I strongly endorse Koverman's second recommendation to the effect that an AAG advisory committee on paper presentations be established for the purpose of providing advice to speakers and visual aid committees.

Malcolm A. Murray
Miami University

PERSPECTIVE ON THE NATURE OF GEOGRAPHY

Richard Hartshorne

201 pp., $5.00, 1959

Rand McNally and Company

P.O. Box 7600, Chicago 80, Ill.

NEW PUBLICATIONS

Salt Marshes and Salt Deserts of the World. V. J. CHAPMAN. Interscience Publishers, Inc. New York. 1960. xvi and 392 pp. illust. $14.50.

This is a scholarly book on a topic of great geographical interest. Its 12 chapters may be grouped into three parts of somewhat unequal length; the first part deals primarily with physical aspects of salt marshes, the second part is regional, and the third part includes biological and economic considerations. The treatment throughout is comprehensive and full of well illustrated details. Even though few geographers specialize in salt marshes or salt deserts, many will find the book useful.

The first part, chapters I through IV, is of particular interest to geomorphologists and pedologists. It contains discussions of such items as distribution, physiography, sedimentation, water table, and physical, chemical, and biotic characteristics of salt marshes and salt deserts.

The second part, chapters V through IX, describes salt marshes and salt deserts from all continents. The treatment is somewhat uneven, insofar as nearly 40 per cent of the regional part is devoted to British salt marshes. Those of Africa, India, Australia, and South America are described on only seven pages. But so much more research has been done on European salt marshes that their preferential treatment seems justified.

Those interested in plant geography will particularly welcome chapters X and XI of part three, which contain discussions of such subjects as plant communities, biogeographical relationships, life forms, ecology, problems concerning halophytes. However, most earlier chapters also contain material of biogeographical interest. In a sense, part one sets the ecological stage and part two presents a regional plant geography of salt marshes, for the chief and outstanding feature of all salt marshes is, after all, their vegetation.

The last chapter of part three, XII, briefly presents the economic aspects of salt marshes, especially problems in reclamation and land-use. Economic and regional geographers will profit most from this chapter.

The title of the book is somewhat misleading because the author devotes nearly all his attention to salt marshes and only little to salt deserts. The book includes a comprehensive bibliography and is well indexed.

A. W. KUCHLER

The University of Kansas

Tribes of the Sahara. LLOYD CABOT BRIGGS. Harvard University Press. Cambridge. 1960. ix and 295 pp. illust. $6.00.

This is the intimate story of native Saharan peoples and their ways of life, as told by a well known anthropologist. The language and viewpoint are not those of the geographer, but the substance of the book certainly is grist for the geographic mill. In semi-popular style, the author details the facts concerning the physical, economic, social, and political conditions of the various Saharan inhabitants; and few geographers, including specialists on Africa, will fail to glean much of value from a reading.

A listing of the constituent chapters will provide an inkling as to coverage and approach. Chapters 1 and 2, on Landscape and Natural Resources and The Background of the Past, provide the physical and historical setting of the region. Chapter 3, The Sedentary Populations, and Chapter 4, Hunters, Food Gatherers, and Nomads Generally, are preparatory to a more detailed analysis of the Tuareg, the Teda, the Arab nomads, and the Moors that are treated in sequence in Chapters 5 through 8. Concluding Chapters, 9 and 10, are entitled Health and Disease and Retrospect and Prophecy.

The value of the book is enhanced by a glossary of regional terms, a bibliography, and a small collection of beautifully reproduced half-tones.

G.F.D.

Latin America: A Regional Geography. GILBERT J. BUTLAND. Longmans, Green and Co., Inc. New York. 1960. xiv and 373 pp. illust. $5.50.

This admirable textbook will best serve the needs of college and university students who still are in the initial stages of their geographic training. Its comparative brevity places treatment of individual topics (general introductions, regions, countries) in the survey category. Use of the volume by more advanced students will require employment of supplementary reading. None of these statements, however, detracts from the quality of the book, for it obviously was not designed for the more geographically mature student.

The organization follows a standard pattern. The introduction deals with historical, physical, and economic facets of Latin America. Part I, approximately one-third of the book, treats Middle America, and includes a general introduction followed by discussions of Mexico, Central America, and the West Indies. This same organization is used in the remaining sections, which are: Part II, The Northern Andean Republics and the Guianas; Part III, The Pacific Republics (including Bolivia); Part IV, The Plata Republics (including the Falkland Islands); and Part V, Portuguese America. The book concludes with references, a glossary, and an index.

The volume contains 61 well-designed maps. A few of these, however, would be more useful if the legends were more comprehensive. There are 32 excellent photographs which are nicely reproduced on glossy paper and bled to the margins of the pages.

P.R.G.

West Africa: A Study of the Environment and of Man's Use of It, 2nd edition. R. J. HARRISON CHURCH. Longmans, Green and Co., Inc. New York. November 1960. xxvii and 547 pp. illust. $10.00.

It is perhaps well for both authors and publishers of geography textbooks that all parts of the world are not simultaneously in such violent political and economic ferment as is present day tropical Africa. If such were the case, the entire geography textbook industry might find itself in a frantic race to keep its output current. Publishers of books on Africa, however, now find themselves in just such a race; and the above listed second edition of a well known textbook on West Africa is a case in point. The first edition was scarcely off the presses in 1957 when it became necessary to plan publication of a considerably revised version.

The new edition maintains the high quality standards of its predecessor, and is organized along the same general lines. Part One, entitled The Physical Basis of West Africa, treats in five chapters that area's geology, coasts and shores, relief, drainage, climate, vegetation, and soils. Part Two, The Resources and Their Development, comprises five chapters devoted to agriculture, livestock and fisheries, minerals and power, transport, and population distribution and movements. Part Three, on The Political Divisions, consists of 18 chapters in which are analyzed in some detail the physical, economic, and cultural geography of each political entity in West Africa.

This book is first class geography, and continues the high traditions established by numerous earlier works in the Longmans geography series. It is well organized and written, and is beautifully illustrated with 125 photographs and almost 100 maps. Helpful bibliographies and map lists follow most chapters, and numerous additional references are included as footnotes.

G.F.D.

The Denver and Rio Grande Western Railroad: A Geographic Analysis. FRANK H. THOMAS. Northwestern University Studies in Geography, No. 4. Northwestern University Press. Evanston. 1960. xxi and 269 pp. $3.75.

Thomas' analysis of the Denver and Rio Grande Western Railroad is a worthy addition to the handful of studies of railways that have been made by geographers. It goes beyond earlier "railroad geographies" mainly in wealth of traffic data and use of statistical techniques. This book, like all dissertations, is a specialized study and will be of interest primarily to transportation geographers and to students of the Colorado-Utah area.

The main theme, and most important

new concept, in Thomas' work is the freight traffic capture ratio. This device expresses the relationship between the potential traffic of a region and the amount actually carried by railroad. A large part of the study is devoted to analyses of the capture ratios of various commodities, and to testing the hypothesis that length of haul, value per ton, and concentration of production are primary determinants of the ability of railways to attract traffic. Attempts to predict capture ratios by use of equations involving these factors also suggest other conditions affecting the generation of railroad traffic.

In the first chapter, the purpose of the study is stated, research techniques are described, and findings concerning traffic capture are presented. The second chapter describes the setting of the Denver and Rio Grande Western in the United States rail pattern, and the general character of its freight traffic. The remaining five chapters of the book analyze originations, capture ratios, and traffic flows of major freight commodity groups: the products of agriculture, animals, mines, forests, and manufactures.

WILLIAM H. WALLACE
University of New Hampshire

An Atlas of Africa. J.F. HORRABIN. Frederick A. Praeger, Inc. 1960. 126 pp. $3.50 (clothbound); $1.45 (paperbound).

The author of this publication has rendered a real service to those interested in Africa. As stated in the preface, "this book is not intended for the specialist;" however, even he will find it most convenient to have such a large number of maps dealing with various aspects of African geography, history, and politics under one cover. The utility of the maps is increased by the fact that practically all of them are accompanied by approximately a page of concisely-written text.

The atlas is divided into three parts. Part I, containing 22 maps, is entitled Background. The following list of map titles, selected at random, will convey some idea of the topics covered in this section: Before the "Scramble"; Cradles of Civilization; First Steps from Barbarism; The Coming of Islam; Kingdoms of the Western Sudan; "Pieces of India"; and The Dutch Trek North. Part II, with 19 maps, is entitled, Today. Random selection of map titles here includes: The Trouble Spots; From Rhodes to Welensky; King Leopold's Crusade; Algeria – European or African?; Mountain Kingdom; New States; Desert Country; and Colonel Nasser's Vision. Part III, Tomorrow, contains 9 maps among which are included such titles as: More Settlers Needed?; The Problem of Language; Mineral Wealth; Water and Water-Power; Mosquito and Tsetse; and Science, Science, Science . . .

Although historical topics are stressed, they are *mapped*, which makes them especially useful to the geographer. Furthermore, as every geographer knows, his field cannot be divorced from history. Hence, this book belongs in the geographer's library, and its modest price should deter no one from purchasing it.

P.R.G.

Races of Mankind: Their Origin and Migration. CALVIN KEPHART. Philosophical Library, Inc. New York. 1960. xiv and 566 pp. illust. $6.00.

The compass of this book is vast. As stated on the jacket, "apparently for the first time in history, the author has connected up all ancient tribes and nations of mankind filially, and traced their routes of migration from primitive regions to present habitations . . . He also explains the causes of racial differences." This, indeed, is a goal to test the mettle of any author!

The volume is divided into 11 chapters, titled as follows: (1) Man's Emergence, (2) Racial Divisions and Subdivisions, (3) Man's Progress and Dispersion, (4) European Conquests by Kelts and Turanians, (5) Dispersion of Kimmerians and Others, (6) Kimmeric Invasions of Western Europe, (7) Suebic Nation and Its Tribal Movements, (8) Getic (Gothic) Nation and Its Fortunes, (9) Sarmatian Nations and Others, (10) Slavs and Other Peoples, and (11) Massagetae and Sakae; Sanskrit Language.

With such contents, this obviously is not a book on geography; but, since geography deals in part with man, the contents are of some interest to geographers. They should prove of equal or greater value to anthro-

pologists, archaeologists, ethnologists, linguists, historians.

One noteworthy deficiency in the work is the lack of adequate maps with appropriately located racial names and migration routes. Likewise, some of the facts and conclusions, such as those on the controversial subject of inherent racial superiority and inferiority, would be disputed by certain authorities. Despite these and other unmentioned faults, *Races of Mankind* is a stimulating and challenging piece of literature that merits reading.

G.F.D.

Geomorphology. B. W. SPARKS. Longmans, Green and Co., Inc. New York. 1960. xx and 371 pp. illust. $7.75.

This new book from England represents a departure from the usual pattern of geomorphology texts. It is directed not at the student who is just entering upon the study of land form development, but at the well-grounded geography major preparing for honors examinations in a British university. Basic knowledge is assumed, and attention is directed principally toward those areas of the subject in which theory is especially complex and controversy especially active.

Virtually the entire book deals with erosional geomorphology; tectonics are touched upon only obliquely, through mention of structure and baselevel change. Even stream deposition receives no more than the briefest treatment. The focus is upon formation of valleys, slopes, and erosion surfaces. The author's personal interest in drainage system development and the effects of lithology is reflected in the length of the discussion of these phenomena and in the large numbers of examples cited, nearly all from the British Isles.

In presenting controversial subjects, such as slope development and stream behavior, the author exposes the reader to most of the principal different schools of thought. He essays critical evaluation of the theories and is not unwilling to indicate instances where, in his opinion, all existing theories are inadequate. The author's own preferences seem to be most often for the traditional or Davisian side of the arguments, but he does not try to compel the reader to accept his beliefs.

Bibliographic lists included at the ends of chapters are valuable, though not exhaustive. The book is well illustrated with line cuts and large half-tones. The writing is straightforward and understandable, with a laudable avoidance of the esoteric terminology that sometimes threatens to engulf geomorphologic discussion.

Because of its advanced level and its concentration upon British examples, American users will probably find Sparks' book more readily employable as a reference than as a text. It may, however, serve as an excellent point of departure for discussion and reading at the seminar level. Although limited in scope, it makes a distinctly worthwhile and needed contribution in providing a nucleus for advanced study in this increasingly complex field.

EDWIN H. HAMMOND
The University of Wisconsin

Goode's World Atlas, 11th edition. EDWARD B. ESPENSHADE, Jr., ed. Rand McNally and Co. Chicago. 1960. xii and 288 pp. $7.50.

Since the first edition appeared nearly four decades ago, *Goode's School Atlas* has been highly regarded for its continuing contributions to American geographic education. Successive revisions through the years have kept the atlas apace of the times, and made it a national standard. The most recent of this illustrious line, the eleventh edition now available under the new title of *Goode's World Atlas*, is more than merely another revision – it is a new atlas, with a new and refreshing map style and a new and expanded utility, but based upon the time-proven selection and organization of world and continental maps developed through prior editions. The form and format of this edition's predecessors have been retained, but the appearance and readability of its maps have been enhanced by adoption of modern map techniques and color symbolization.

Surface configuration on continental and regional maps is shown in a different manner from that employed in previous editions. A combination of two techniques is utilized which gives a striking three-dimensional effect. Elevations above sea level are indicated by color layer-tints of differ-

ing hues, which have been selected and arranged so that color values increase with increasing elevation, in contrast to the more conventional layer-tint colors employed previously. Thus, although shades of green are still used for lowlands below 1,000 feet, hues of light tan, buff, and yellow are used for successively higher elevations, with areas above 10,000 feet shown in white. An oblique shading in gray is superimposed over the layer-tints, to indicate local relief and steepness of slopes. This gray shading, when superimposed over differing elevation hues, gives a realistic visual impression of the gross surface configuration of the earth. The three-dimensional effect is most noticeable in high mountain regions where slopes are steepest, because shadow contrast is greatest in areas where color values are highest. This new presentation overcomes some of the inherent limitations of the conventional layer-tint system and markedly enhances reading of the maps. It should reduce considerably some of the misconceptions obtained when layer-tints alone are used.

A local-name policy is followed throughout the atlas in the naming of cities and towns as well as local topographic and hydrographic features. A new glossary of several hundred foreign geographical terms has been added, and the pronouncing index of over 30,000 geographical names has been completely revised for greater utility and completeness.

This new world atlas will certainly take its place as a standard and authoritative reference for geographers both in the library and classroom, as well as for scholars in other fields.

C. H. MACFADDEN
University of California at Los Angeles

Our Developing World. L. DUDLEY STAMP. Faber and Faber. London. 1960. 195 pp. illust. $5.00.

This book is a revision of L. Dudley Stamp's previous volume, *Land for Tomorrow.* The fundamental problem of population pressure provides a background theme for every chapter. The author presents a rather optimistic view of the possibilities of feeding the present world population of 3 billion, and of taking care of double this number within the next 40 years.

Doubling the world's food supply in less than half a century is not a simple matter, but Professor Stamp cites numerous cases of advancement in the realms of cover crops, soil fertilization, seed selection, insecticides, mechanization, and irrigation which will help to solve the problem. Food from the sea is said to hold great promise. Decreased production of meat and dairy products, and greater emphasis on output of cereals, would provide more food per acre.

Although Japan is presented as having taken a significant step forward in population control, most of the world is not expected to move rapidly in this direction. Anent this, the author states that "The knowledge and practice of death control have been expanding more rapidly than the knowledge and practice of birth control."

Attention is given to the tropics as present and future sources of food, minerals, and water power. The hot deserts and polar regions are evaluated. The outstanding underdeveloped areas of the world are said to be the agricultural lands of the middle latitudes; intensive rather than extensive agriculture is recommended for these areas.

American readers will be somewhat shocked by the chapters on the Poor Little Rich Girl and Poor Relations – The Under-Developed Countries. The roles played by the United States in these respects are too true for comfort, and the English author writes about the United States as some Yankees write about Texas. Perhaps the truth will bestir us to corrective action before it is too late.

WALTER HANSEN
North Texas State College

Physical Geography, 2nd edition. ARTHUR N. STRAHLER. John Wiley and Sons, Inc. New York. 1960. vii and 534 pp. illust. $7.50.

A revision of such a well known and highly respected textbook is most welcome, especially when revision incorporates features that render it more acceptable to many members of the geographic profession. The more important of these changes are the introduction of the Koppen climatic system as a basis for analysis of world climates, and the use of familiar terminology in the naming of climatic types.

For the few geographers who are unfamiliar with the content and organization of the book, it can be stated that in substance and structure it conforms to the general pattern followed in contemporary competitors. But, as in the case of all books, the author has imparted to his literary offspring a verbal flavor and style all its own.

As one might suspect because of the author's primary field of interest, he achieves a particularly successful product in the last and longest of the book's four Parts — that devoted to Landforms. He also does a most meritorious job in Part One, the Earth as a Globe, and Part Two, The Weather Elements. The reviewer continues to believe that, as in the first edition, Part Three, Climate and Soil, is the least well developed portion of the volume. This statement, however, should by no means be construed as a criticism; it is merely an expression of opinion as to relative merit. Any man who succeeds in producing so praiseworthy a volume as *Physical Geography* receives only high commendation from this reviewer, for he can fully appreciate the "blood, sweat, and tears" that go into such an undertaking.

G.F.D.

The Preindustrial City: Past and Present. GIDEON SJOBERG. The Free Press of Glencoe, Illinois. Chicago. 1960. xii and 353 pp. $6.75.

This work focuses on the class structure of preindustrial (i.e., feudal, or literate preindustrial) cities and points out the many similarities between social structures of these cities and urban systems in lesser developed countries today. The preindustrial city is also compared to the present metropolis by way of contrast. The origin and nature of cities is first presented in some detail, after which their spread and development are examined. Next, Sjoberg discusses their demography, class structure, marriage, political, social, and educational systems. Differences between elite, low class, and outcaste groups in preindustrial cities are explained.

A partial chapter on the ecology, or land use pattern, of preindustrial cities is included. Sjoberg stresses the fact that preindustrial cities were compact, crowded, and often walled. Spatial differentiation occurred primarily on the basis of ethnic, occupation, family, and religious differences. Thus, for example, the center of the preindustrial city was usually occupied by religious and political functions as well as homes of the elite.

The book is a salutary reminder to provincial scholars who have neither traveled nor read about the rest of the world. The author shows that many generalizations about present day American cities do not represent universals in time or place. Although the book contains no maps and does not stress spatial matters, it may be helpful to geographers working with urban aggregations in today's underdeveloped countries.

RONALD R. BOYCE
Washington University

General Climatology. HOWARD J. CRITCHFIELD. Prentice-Hall, Inc. Englewood Cliffs, N.J. 1960. xiii and 465 pp. illust. $10.60.

This book may well turn out to be *the* textbook for beginning courses in climatology offered by departments of geography in colleges and universities of the United States. It is written by a geographer-climatologist, and is aimed at geography students for its readership. The language employed is non-technical and the treatment is non-mathematical; yet, the results achieved through skillful phraseology and organization provide the geographic neophyte with a firm foundation in the subject.

The author divides his materials into three parts. Part One, consisting of six chapters, deals with the standard topics that are prerequisite to a study of climatology: atmospheric heat and temperature, pressure and winds, moisture, air masses and storms, and weather forecasting. Part Two, four chapters in length, describes the several important systems of climatic classification, and then considers the various climates of the world. Part Three, comprising seven chapters, is unique in its length and treatment, and is particularly applicable to the geography student. It analyzes the significance of weather and climatic factors to soils, vegetation, water resources, agriculture, transportation and communication, industry, housing, and the human body. This last section also deals briefly with the

subject of climatic change and cycles. Appendices include a selected bibliography, a series of abridged meteorological tables, and a supplementary set of climatic data.

Any geographer who teaches a course in climatology owes it to himself to at least investigate this book.

G.F.D.

Agriculture and Ecology in Africa: A Study of Actual and Potential Development South of the Sahara. JOHN PHILLIPS. Frederick A. Praeger, Inc. New York. 1960. 424 pp. $13.50.

The author of this book was born in Africa and has worked there, since his graduation from the University of Edinburgh, as a teacher, researcher, and adviser in forestry, conservation, agriculture, and ecology. He established the Faculty of Agriculture of the University College of the Gold Coast (Ghana) and is currently Professor of Agriculture at the University. With such a background, he is well qualified to deal with the topic of African agriculture and ecology.

The publication deals specifically with problems of agricultural development in Africa, stressing the need for comprehensive economic and geographic research before large-scale enterprises are undertaken. As an example of this need, the author points out the lessons to be learned from the East African Groundnut Scheme. Other enterprises discussed include the Gezira Scheme and the Volta River Project.

The publication is divided into five "Books." Book One deals with background material, Book Two with the forest bioclimatic region, Book Three with the wooded savanna and related bioclimatic regions, Book Four with problems of human and animal health and of economics and planning in agriculture and related development, and Book Five is devoted to general conclusions and suggestions. The volume concludes with a bibliography; a folded, colored map of the major bioclimates in Africa south of the Sahara; and an index. There are many tables, but, except for the above-mentioned, no other maps. The latter is a weakness of which geographers will be especially aware. However, the book contains so much valuable information, as well as so many ideas, that geographers should be willing to forgive this sin of omission.

Since African affairs are occupying such a large proportion of the current news, this publication is timely and should be useful to people in a variety of professions.

P.R.G.

Manual of Photographic Interpretation. ROBERT N. COLWELL, ed. American Society of Photogrammetry. Washington, D.C. 1960. xv and 863 pp. illust. $12.00 (members); $15.00 (non-members).

This book, third in the series of manuals issued by the American Society of Photogrammetry, is the reference source *par excellence* in its field; it is a veritable bible for the photo interpreter. As such it should be accessible to, and preferably on the bookshelf of, every geographer, for whom among us can call himself professionally competent without some knowledge of how to use effectively that most revealing of all sources of earth-surface information — the aerial photograph.

The *Manual*, after disposing of necessary preliminary materials, is organized around the several academic disciplines having vital interest in the use of aerial photos. Thus, 11 of the 16 chapters deal with photo interpretation in geology, soil science, engineering, forestry, wildlife management, range management, hydrology and watershed management, agriculture, urban area analysis, archaeology, and geography. By no means, however, should it be implied that the geographer can confine his reading solely to the chapter devoted to his field. His interests in the earth shell are so cosmopolitan that he will profit greatly from a study of the entire book.

One of the unique features of the *Manual* is its use of aerial color photography. Several dozen such illustrations, including color stereograms, supplement the hundreds of black and white photos that profusely illustrate the volume.

G.F.D.

ERRATUM:

The publisher of *Atlas of the Arab World and Middle East*, reviewed on page 33 of the November, 1960, issue of *The Professional Geographer*, is Djambatan Ltd., Amsterdam, The Netherlands.

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